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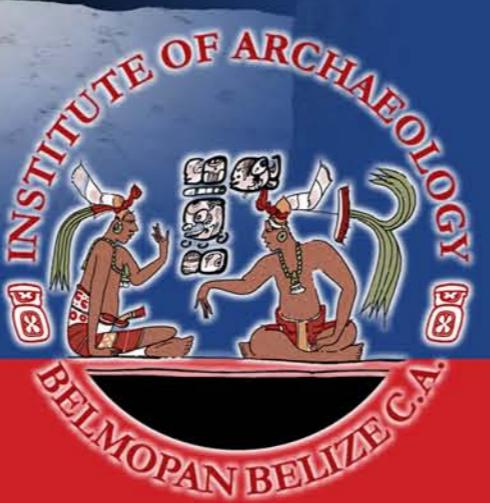
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Papers of the 2010 Belize Archaeology Symposium

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John Morris, Melissa Badillo, Jaime Awe
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Archaeological Investigations in the Eastern Maya Lowlands: Papers of the 2010 Belize Archaeology Symposium

Edited by John Morris, Jaime Awe, George Thompson and Melissa Badillo



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2011

Research Reports in Belizean Archaeology

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Meetings of this scope are never possible without professional participation. We therefore thank all of our colleagues who took time from their busy schedules to attend and present papers in our symposium. The various themes of their papers serve to reflect the diversity of Belizean Archaeology, and provide a wealth of scientific information to the people of Belize.

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John Morris and Jaime Awe
Belmopan, Belize, June 2011

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SECTION ONE: STATUS AND POWER IN ANCIENT MAYA SOCIETY

1 STATUS AND POWER: CARACOL, TEOTIHUACAN, AND THE EARLY CLASSIC MAYA WORLD

Arlen F. Chase and Diane Z. Chase

The archaeological interpretation of status and power is fraught with a variety of issues. While it is sometimes possible to identify those individuals of highest status – and, presumably, power – in the archaeological record, for the most part issues of status and power can become a quagmire for archaeological interpretation. While the verticality of social relationships may sometimes be evident in the archaeological record, the horizontal aspects of socio-political relationships are more difficult to document. Status and power also need to be viewed comparatively as they may vary depending on the arena of interaction. Because agency is involved in determining status and power, what the archaeologist records may not clearly or directly reflect ancient reality. This paper examines the archaeological interpretation of status and power in the Maya area using examples derived from Caracol, Belize – with particular attention paid to an Early Classic cremation unearthed during the 2010 field season that has applicability to discussions of broader Mesoamerican interactions and relationships.

Introduction

What constitutes status and power in the archaeological record? The answer varies depending upon context and scale. Both status and power are relative terms that imply a hierarchical relationship between two or more individuals or parties; this hierarchical relationship can either entail proscriptive or consensual actions and can vary (to the point of being inverted) depending upon the situation. Higher status individuals evince more prestige and/or resources than other individuals or groups, but status also can vary depending upon the relational situation. One may be born with ascribed rights or status, but other also may be achieved through certain life accomplishments. Power usually implies control, either over people or resources; it also implies the ability to undertake certain actions. In life, such relationships were often in flux and could change over time, being dependent upon location and context.

This dynamic aspect of status and power relationships makes archaeological interpretation context-dependent. For instance, in central Mexico, green obsidian artifacts from Pachuca are quite common, as might be expected as Cerro de las Navajas source is only 50 km northeast of Teotihuacan; some 90% of the prismatic cores and blades at Teotihuacan are of green obsidian (Spence 1996:23). Thus, the use of green obsidian artifacts in central Mexico

does not necessarily imply a certain status or any unusual power. However, when green obsidian artifacts are found in the Maya area, they are often seen as being special – the products of long-distance relationships or exchange (e.g., Braswell 2003; Moholy-Nagy 1999). The presence of green obsidian artifacts in Maya contexts therefore may lead to a discussion of status and power because of the exotic nature and long-distance origin of these artifacts.

This paper seeks to briefly review the concepts of status and power and their implications with regards to archaeological interpretation. To accomplish this, the concepts first will be situated and defined relative to anthropological theory. Next, the terminology will be applied to current usage in Maya archaeology. Finally, an Early Classic archaeological deposit from Caracol, Belize will serve as an example of the issues involved in analyzing status and power in the archaeological record.

Status

Linton (1936: 113-114) noted that statuses are “the polar positions . . . in patterns of reciprocal behavior,” defining “polar position” as a “collection of rights and duties.” While the “rights and duties” define the boundaries for social relationships and behavior, “privilege” refers to options that exist within these prescribed boundaries and “role” constitutes the dynamic aspect of

status, where the actions of the individual or group put into effect the socially privileged rights and duties. Goodenough (1965:3) importantly noted that the analysis of status looks at boundaries and not at the range of available behaviors within a specific polar position:

“For status analysis, the boundaries (the rights and duties) command our attention and not the domain of idiosyncratic freedom (privileges). As for powers, they and their liability counterparts stem from privileges, while immunities result from rights and the observance of duties. None of them needs to be treated as a feature of status relationships that requires analysis independent of the analysis of rights and duties.”

Goodenough (1965:2) further noted that, while the concepts of statuses as “collections of rights and duties” and as “kinds and categories of persons” have become inextricably linked, that these two definitions should really be analytically separated.

In his important paper looking at the use of status and role in cultural anthropology, Goodenough (1965:3-4) demonstrated the use of these terms in modern Trukese society. He showed that each individual in any society has a number of different social identities and that each social identity has different rights, duties, and corresponding appropriate behaviors. Thus, because each individual has more than one status or social identity, it becomes imperative to analyze the situational nature of each social interaction in terms of status and role. Goodenough (1965:4-5) further noted that the parties in status relationships are not always individual human beings; the party that forms the “alter” in a status relationship may also be a group of individuals or may even be “animals, inanimate objects, and purely imaginary beings” that “may also possess rights and/or owe duties.”

Social identities – or statuses – are selected based on several factors (Goodenough 1965:7): (1) the ability to appropriately possess an identity; (2) the

occasion for the interaction or activity; (3) the setting; (4) the polar positions of an identity relationship and their arrangement with one another in identity relationships; (5) the number of identity relationships possible within a culture; and (6) the range of identities available to an individual simultaneously and their compatibility in constructing a coherent social persona. In any analysis of status, the two polar positions must be clearly understood. Goodenough (1965:6) pointed out that “... for any identity assumed by one party, there are only a limited number of matching identities available to the other party,” noting that “we take care to employ various signs by which to communicate the identities we wish to assume, so that others may assume matching ones and we can interact with mutual understanding.” Thus, there are any number of status relationships in a complex society and “the aggregate of its composite statuses may be said to constitute the identity’s *role*” (Goodenough 1965:16).

While status and role can be difficult to analyze among living populations, doing so in the archaeological record is even more challenging. We traditionally note the difference between “achieved” versus “ascribed” status as important indicators for social complexity, hoping to identify these statuses in mortuary remains by particularly focusing on status differentiation other than that associated with gender or increased age (Peebles and Kus 1977). We also write about “elites” (D. Chase and A. Chase 1992) and “commoners” (Lohse and Valdez 2004), but even our archaeological markers for these statuses are not completely secure – and status must be differentiated from wealth (e.g., Smith 1987). However, following Goodenough (1965:6), “various signs” can communicate assumed identities or “statuses” – and it is these signs or symbols that can be contextually located in the archaeological record to aid in the identification of status and identity.

Power

While archaeologists generally recognize different kinds of power – social, economic, political, and religious – seeing power in the archaeological record again requires the interpretation of ancient remains. Like status, power can be conceived of as a two-party relationship between actors and respondents. Similar to Goodenough's view of status, Talcott Parsons (1969:279) conceived of power "as a *generalized symbolic medium* operating in the process of social interaction." In this conception, the symbols should be archaeologically recognizable.

To analyze power in the archaeological record, one needs, first, to determine if power does in fact exist and then, second, to make comparisons of kinds of power. Dahl (1969:83) notes that an analysis of power requires a definition of differences: (1) in the basis of power; (2) in the means of employing the basis of power; (3) in the scope of power (and the response evoked); (4) in the number of comparable respondents; and, (5) in the change in probabilities. Importantly, the structure of power must also be understood (Kornhauser 1969:42): How is power distributed among major segments of society? How has the structure of power changed over time? What is the operation behind the structure of power (and the means by which it is exercised)? What are the factors that shape and support an existing distribution of power (and its bases)? And, finally, what are the consequences of a given power structure in terms of society?

For archaeology, considerations of power have had their greatest impact in discussions of ancient socio-political realms. State formation has become characterized as depending "primarily on the coercive power and absolute divinity of autocratic leaders whose highly centralized rule exploited commoners and largely precluded collective action or social contracts" (Blanton and Fargher 2008:5). Symbols of power and authority in the archaeological record are usually identified as representative of these leaders (Peebles and Kus 1977).

Complexity has often been cast in terms of centralization versus dispersion of resources in the archaeological remains. Authority and legitimacy have come to be viewed as being vested in the state and as being reflected in public art styles (Marcus 2007); however, both power and legitimacy are needed to constitute authority (Smith 2003:108). Less talked about in archaeological reconstructions are the differences between coercive and consensual power, which can also be referred to as "power over" versus "power to" (Smith 2003:108) or – more popularly – as "oppression theory" versus "collective action theory" (Blanton and Fargher 2008).

Potentially confounding deliberations, but in actuality overlapping in scope, are archaeological discussions over hierarchical versus heterarchical organization of past societies. Although applied only relatively recently in Maya archaeology (Scarborough et al. 2003), these alternative power structures have a long history in other fields, such as political science. For example, in a 1969 discussion of relational power structures, Brams (1969:347) outlined three types of decision-making systems, called "hierarchical," "mutual adjustment," and "mixed;" both the hierarchical system and the mutual adjustment, or heterarchical, system were characterized by Brams as being "extreme" heuristic models in terms of real situations – a characterization that is relevant, as well, for our current archaeological considerations.

The Archaeological Interpretation of Status and Power: General Considerations and Caracol

While difficult to translate from the archaeological record into a systemic context, status and power both are manifested in the archaeological record through the use of symbols – including those that are part of the built environment. These symbols can be massive or small. They can be large-scale public architectural constructions or, alternatively, attributes of personal dress. Access to foreign goods is also often used as an archaeological marker

for status and power (Braswell 2003:138; A. Chase and D. Chase 1992). However, as noted above, context and scale are very important variables in any analysis.

Both status and power can be conceptualized as existing on a series of levels during the Maya Classic Period (A.D. 250-900). At one end of the scale is the individual; at the other end of scale is cosmology. Interspersed between these two poles are families, residential groups, extended communities, inclusion in broader political units (or states), and interaction with exterior political units (or states). For each of these various levels and permutations of interactions, material remains in the archaeological record, especially those that may function as “symbols,” must be interpreted to convey meaning in terms of status and power.

Individual status and power may be conveyed by means of personal accoutrements and costume. While the decoration on clothing and cloth in the Maya area surely once denoted group membership (e.g., Morris and Foxx 1987; Hendrickson 1995) and, by extension, status, for the most part these items have not been preserved in the archaeological record. Often, they can be seen only in iconographic details that have been carved onto stone monuments or hard-fired onto painted ceramics – or in the items of personal adornment accompanying the dead. While pottery vessels often were interred with individuals in a recipe-like format (D. Chase 1997; D. Chase and A. Chase 2011) – one plate, one cylinder, and possibly one bowl per person – probably associated with a generalized death ritual, other artifacts may have functioned as status indicators. At Caracol, stone spindle whorls can be used to identify high status individuals who worked cloth (A. Chase et al. 2008a). Even more telling as personal status indicators at Caracol are the ear assemblages that accompanied the dead. The highest status individuals have jadeite or obsidian earrings; other high status individuals used shell earrings. The presence of the jadeite and obsidian earrings primarily in the site epicenter also stresses

the importance of location (and context) in status assignations. While other foreign or exotic goods may occur in high-status burials, such items are not restricted in their distribution – often occurring in non-epicentral contexts or even sometimes in lower-status interments.

Of additional interest in looking at status at Caracol are two other bodies of data. The first dataset is the isotope analysis that has been done at Caracol. Stable isotope analyses indicate the existence of a “palace diet” at Caracol that was generally restricted to the occupants of palaces and that appears to have been fairly consistent over time (A. Chase et al. 2001). The occasional presence of the palace diet in the bones of individuals interred in outlying residential groups demonstrates the use of lower status retainers in these palaces by the elite. Even more intriguing, the stable isotope analyses can be used to identify lower status retainers or support staff that lived and were buried in smaller groups adjacent to the epicentral palaces (A. Chase and D. Chase 2007); these individuals do not seem to have had great access to maize, probably because they did not have their own agricultural lands. Thus, at least for Caracol, diet can be related to socio-economic position typical in stratified societies where there is differential access to basic resources (Fried 1967). A second body of data that may have related to Maya status and role are inlaid teeth. Almost 22% of Caracol’s dead appear to have had one or more teeth inlaid with hematite or jadeite (D. Chase 1994). Yet, the patterning of the inlays on these teeth and the location of the dead with this kind of dental decoration has not yet been satisfactorily correlated with considerations of status and power. The use of dental inlays at Caracol can be seen in some of the most elite burials that have been recovered and in other interments that, by most measures, should be of lower status.

Maya residential groups have also been extensively analyzed for referents to status and power indicators in the archaeological record. At both Tikal (Becker 2003) and Copan (Fash 1983), residential groups have been categorized by generalized ground plan



Figure 1. Vaulted building from a Caracol residential group, indicative of high social status. Example shown is Caracol Structure F36, excavated during the 2010 field season.



Figure 2. Photograph of S.D. C117F-1, showing the extent of the sealed pit and the broken and burnt artifacts within the cremation.

in an attempt to understand their function. At Caracol, besides defining general categories of ground plans (A. Chase and D. Chase 1987), in an attempt to analyze function and status, we have also looked at building height, group platform height, group alignment, number of buildings per group, distance from the epicenter, distance from termini, distance from causeways, and farming area controlled (A. Chase and D. Chase 1994; Jaeger 1994; Murtha 2009). The majority of these variables were shown to have no direct correlation with status and, by extension, power. At Tikal, the use of a Plaza Plan 2 – characterized by an eastern shrine in a residential group – was correlated with higher status; however, this ground plan only occurs in 15% of that site's residential groups (Becker 2003). At Caracol, more than 60% of the residential groups are characterized by such an arrangement (A. Chase and D. Chase 1996). In conjunction with the use of formal tombs and specialized ceramic cache containers, this residential arrangement has been categorized as part of a broader Caracol identity (D. Chase and A. Chase 2004a) and, thus, not linked to status.

So, what does represent status and power in a residential group at Caracol? Craft production related to shell, lithics, and wood is evident in many of Caracol's residential groups and, while some of this production must have been done to gain capital for use within the broader site economy, there is no indication that it conveyed elevated power or status to the group's inhabitants. This interpretation is consistent with research that correlates craft production with lower status residential groups (Moholy-Nagy 2003). Building and platform size is similarly problematic. While the size of the residential unit may sometimes be telling, many of the larger groups at Caracol are the result of the extended use of those loci over time. However, what does appear to be an indicator of higher status is the presence of a stone building with a vaulted roof within a residential group (Figure 1). Many

residential groups do not have such a building, but vaulted buildings are found throughout the Caracol landscape. Because the eastern building at Caracol generally functions as a shrine structure that is not correlated with a stone construction, when they occur, vaulted stone buildings – often heavily stuccoed – are found on the southern, western, or northern sides of plazuela groups. The effort that went into their construction minimally reflects the wealth of a specific residential group and may well be reflective of a higher status within the overall Caracol community. Often, important vaulted buildings on the northern sides of plazas were used to both start and end interment cycles.

From an archaeological standpoint, most analyses of status and power occurs at the level of the residential group. At Caracol, interment in a tomb in and of itself is not an indicator of elite status (A. Chase 1992). Tombs are associated with the majority of the eastern shrines in residential groups and were part of what it meant to be a Caracoleño. Being buried within the eastern shrine of a given residential group was indicative of some social standing (even if relative). No more than 10% to 15% of the dead from any residential group were actually interred within their household (D. Chase 1997). And, those that were interred were apparently buried according to temporal or ritual cycles (D. Chase and A. Chase 2004b, 2011); some were dressed to represent specific deities in death (such as the moon goddess; Rich 2003). Thus, the interments in these groups were part of broader rituals and only indirectly reflected the statuses of the interred individual in life.

Considerations of status must also keep in mind broader political organization and inter-polity relationships. The size and kinds of public architecture have been used to assign status rankings and political assignations to sites in the Maya area (see Adams and Jones 1981; Turner et al. 1981). E-Groups appear to have been used as symbols for the founding of individual Maya cities in the Southern lowlands (A. Chase

and D. Chase 2006a). Ball-courts have been analyzed to see interactions between polities (Barrois and Tokovine 2005). Temples, palaces, and royal courts (Inomata and Houston 2001) have all been analyzed along a similar vein. Even more analyzed and debated has been the Maya hieroglyphic record. The very presence and number of such texts on stone monuments at a site is often taken to be a measure of that site's importance. While generally recognized as being largely restricted to use by the Maya elite (Marcus 1992; Stuart 1993), status relationships among Maya states are often interpreted through the use of emblem glyphs, parentage and sibling notations, and other "power glyphs" (Martin and Grube 1995, 2000). Like other archaeological considerations of status and power, however, these hieroglyphic models are still in flux (Houston and Lacadena 2004; Martin 2005; A. Chase et al. 2008b).

An important point in conceptualizing power and status in the archaeological record, then, is that such considerations should not be simplistic. The pertinent data for interpreting power and status are multi-faceted, context-dependent, and dynamic. Even individual status and role may not be identifiable in death if individuals are interred within a standard ritual formula. Another deranging factor would be "wealth," which is not necessarily correlated with status (e.g. Smith 1987); wealthy commoners may have accumulated sufficient wealth to have access to at least some luxury goods and may have been able to harness sufficient human power to build substantial residential areas. This is all part of the dynamic with which archaeological interpretation needs to concern itself.

Having briefly looked at definitions of status and power, we now turn to a specific example of a single archaeological deposit that permits us to examine these concepts in detail.

Specific Consideration of Status and Power: Caracol Special Deposit C117F-1

Excavated during the 2010 field season of the Caracol Archaeological Project,

Special Deposit C117F-1 provides both a unique example of the concepts embodied in status and power and the difficulties involved in their interpretation (Figure 2). Placed deep beneath the courtyard of Caracol's Northeast Acropolis, the deposit dates to between A.D. 250 and 350. As the deposit contains the cremated remains of at least 3 individuals, it may technically be labeled a burial - but, it is an interment unlike any other at the site. The deposit is sealed by an Early Classic plaza floor level that lies approximately 2.2 m below the last Terminal Classic floor level for the Northeast Acropolis courtyard plaza. The deeply buried Early Classic floor rests immediately above another plaster floor that was heavily burned. The pit for burial S.D. C117F-1 was dug through this lower floor and then was sealed by a capping stucco surface that was in turn covered by the last Early Classic flooring. Because the cap over the pit was not burned, the disturbance was easy to spot.

Upon removing the cap, a square pit with rounded corners, measuring 1.6 m by 1.6 m, was exposed; the sides of the pit were calcined, indicating that intensive *in situ* burning had taken place. However, the upper part of the pit below the stucco cap was sealed to a depth of 30 cm with sterile marl. At a depth of 30 cm, however, a thick layer of ash appeared; removal of the upper part of the ash resulted in the exposure of burnt and broken artifacts and bone chips. Beneath the ash was a 2-3 cm thick layer of carbonized wood that completely filled the bottom of the pit and that represented the remains of the intense fire that had taken place at this locus and into which the bone and artifactual materials had been deposited. Based on an analysis of the burnt teeth, at least 3 individuals were present: one adult, one child between 10-15 years of age, and a subadult about 5 years old. Given the fragmentary nature of the burnt and broken bone, as compared to the artifactual materials, the bodies may have been cremated elsewhere and crushed into smaller pieces (perhaps using the partial metate that was included in the deposit). Alternatively,

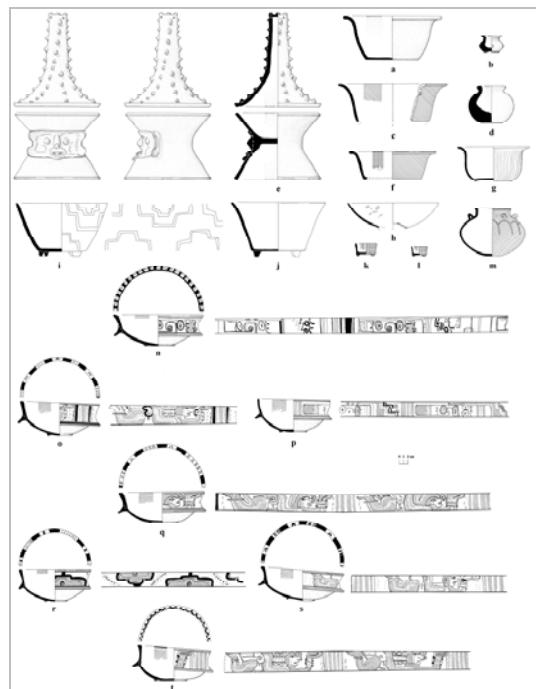


Figure 3. Re-assembled pottery vessels from within S.D. C117F-1.

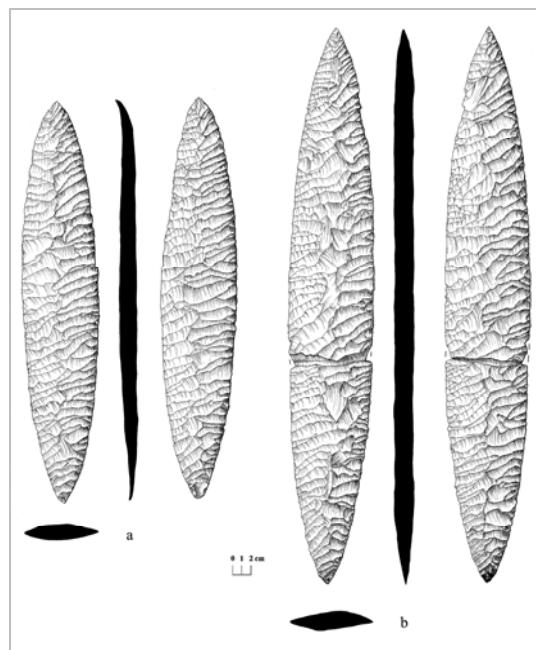


Figure 4. Re-assembled green obsidian knives from within S.D. C117F-1.

the cremations may have occurred within the pit, in which case the bone would have been burnt *in situ* in this pit first and then the artifactual materials would have been subsequently added.

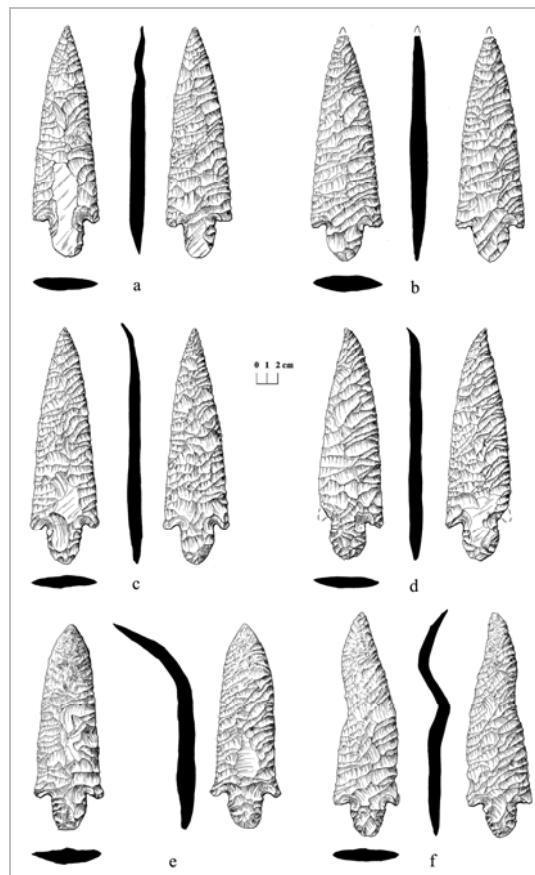


Figure 5. Green obsidian points from within S.D. C117F-1; warping (and discoloration) resulted from the points being used to poke or stir the fire used for the cremation.

Unlike the bone, most of the artifactual material was reconstructable, even though it was badly broken and exhibited differential burning. Besides the remains of three cremated individuals, artifactual materials added to the pit included 20 ceramic vessels (Figure 3): 7 polychrome basal flange vessels, 2 large footed tripod bowls, 1 constricted-necked bowl, 3 miniature vessels, 1 small jar, $\frac{1}{2}$ of a possible thin orange dish (Figure 3h), 4 everted rim bowls (2 partial), and a 2-part effigy censer. Parts of some vessels are completely incinerated, while other parts of the same vessel are barely scorched – indicating that these items were broken before being added to the fire or that they may have been thrown into the pit with some force. As three of the vessels were not complete, it is thought likely that some destruction took place away from the

final resting place for the materials. Other artifactual materials in the deposit included: 2 probable hematite earrings, 1 oblong slate backing, 1 partial metate, 2 green obsidian knives (Figure 4), 6 green obsidian points (Figure 5), 15 green obsidian blades, partial blades of both green and gray obsidian, 4 large jadeite beads, 1 hematite mirror, more than 150 badly burnt shell beads, a possible atlatl tip (Figure 6), and a host of carved and uncarved shell and bone objects. It is suspected that the green obsidian spear-points from S.D. C117F-1 were still attached to their shafts and were used to poke or stir the still-burning fire, thus accounting for the deformed tips and warped bodies of many of the specimens. The intensity of the heat is evident. The hematite mirror had essentially melted because of the fire. In some cases, parts of pottery vessels had totally disintegrated due to the burning. In other cases, pieces of the pottery vessels had swelled in size and become distorted like the obsidian spear-points. The temperature for the fire was probably on the order of 1100 degrees centigrade (Cabrera Castro 1999:520); similar deformation of obsidian spear-points is recorded from Hohokam cremations in the U.S. Southwest (McGuire 1992).

The Northeast Acropolis has a long history of occupation. Refuse in the soil overlying bedrock in front of Structure B33 dates the initial use of this locus to approximately 100 B.C. The remains of two Late Preclassic buildings have also been found constructed above this refuse; both of these structures were completely engulfed within later fills. One of these buildings was cut through to place an interment dating to approximately A.D. 150 (A. Chase and D. Chase 2005:22, 2006b:46). This eastern interment was of a woman guised as the moon goddess (*Ix Chel*; Rich 2003) and accompanied by 32 vessels and 7,000 jadeite and shell beads. She, in turn was sealed by the same floor through which S.D. C117F-1 was placed. During the 2009 field season, an Early Classic tomb was found interred on the summit axis of Structure B32. This east-west tomb contained a single supine

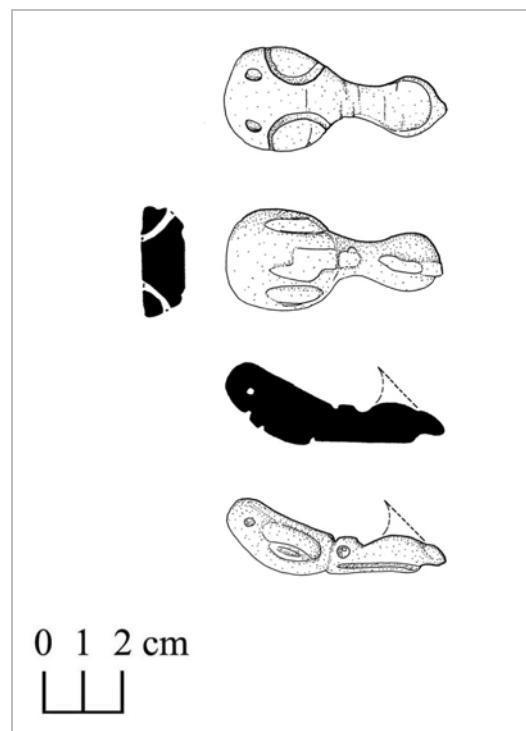


Figure 6. An incinerated, but elaborately carved, shell artifact was probably embedded in a wooden shaft and used as the throwing tip for an atlatl.

individual with hematite inlays in three teeth; the individual was accompanied by a single polychrome bowl with the same design as 4 of those found in S.D. C117F-1; also in the chamber were 3 other ceramic vessels, 2 large spondylus shells, a necklace composed of 54 shell beads, a shell disk, and 3 pieces of pyrite. The contents of this tomb indicate a close corresponding date with the deposit in the courtyard in front of Structure B32. Although the individual interred in the Structure B32 tomb surely was of high status based on location, the tomb contents were nowhere near as impressive as the contents of S.D. C117F-1 – nor do they raise as many questions.

So what does S.D. C117F-1 represent? And, how does it relate to discussions of status and power? Several of the artifacts from S.D. C117F-1 are the result of long-distance trade and should help to inform us as to Mesoamerican relationships in the Early Classic and perhaps past trade routes that skirted the central Peten. The two green obsidian knives in the Caracol deposit are

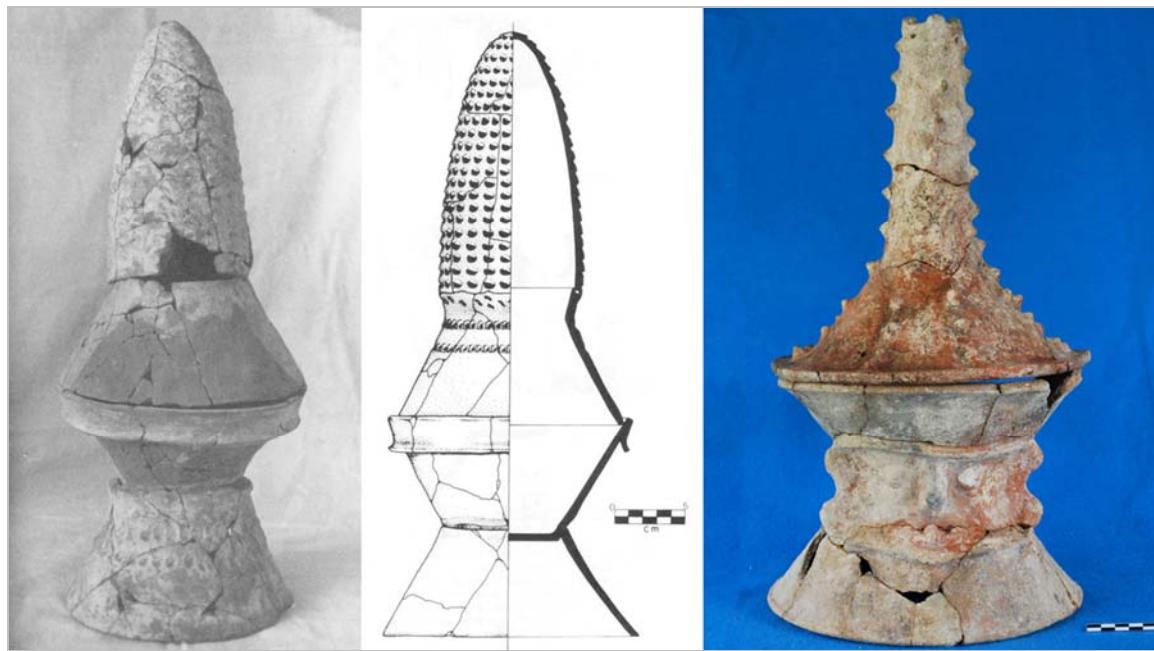


Figure 7. Comparison of the Caracol S.D. C117F-1 censer (right) with Early Xolalpan censers (left photograph and drawing) from the Oaxaca Barrio at Teotihuacan (after Rattray 2001:517).

only rarely noted from the Maya area – and, at 36 cm in length, one is the largest recovered. Similar knives derive from relatively few Maya sites: two are known from Uaxactun (Spence 1996:29); one from Pacbitun (Healy 1992); and, one from Kaminaljuyu (Kidder et al. 1946:138); none are known for Tikal (Moholy-Nagy 1999:303). The 6 green obsidian spearpoints from the Caracol deposit are trade items from central Mexico; their shape is called “Stemmed B Type” there (Spence 1996:23). Seven Stemmed B points were recovered from Tomb A-7 at Kaminaljuyu (Spence 1996:26); only one other complete Stemmed B point is reported for the Southern lowlands – at Altun Ha. At Tikal, the only complete green obsidian points are classified as “Stemmed A Type” (Moholy-Nagy 1999:304). The three miniatures in this deposit also relate to central Mexico (Rattray 2001); similar forms are noted as well from a deposit at Altun Ha, where green obsidian and ceramics with clear relationships to central Mexico were found above an Early Classic Maya tomb (Pendergast 1990; 2003). One of the partial Caracol vessels may also be a Thin Orange

tradeware from central Mexico. The 2-part censer is clearly Maya, but also resembles Early Xololapan composite censers from the Oaxaca barrio at Teotihuacan (Figure 7; see also Rattray 2001:517). Intriguingly, the burial pit itself is the same size as burial pits from Teotihuacan and is also constructed, as most burial pits at Teotihuacan were, by being dug into pre-existing layers “as a simple earthen pit” (e.g., Sempowski 1992:32, fig. 1).

Cremations are noted for Teotihuacan for high status individuals (Manzanilla 2002:61; Manzanilla and Serrano 1999), and S.D. C117F-1 would be considered a “Level 1” cremation (exceedingly burnt and reduced) in the Teotihuacan typology (Cabrera Castro 1999; Sempowski and Spence 1994). Many years ago, Linne (1942) demonstrated that broken pottery was burnt in association with cremations at Teotihuacan. Modern researchers have noted that “there is a positive correlation between incinerated burials and offering complexity” and status (Sugiyama 2005:207) at Teotihuacan. Other researchers at Teotihuacan have noted that higher status adults were more likely to be

buried in public areas, particularly principal courtyards (Manzanilla 2002; Sempowski and Spence 1994:251; Serrano 1993). Sempowski (1992:33-34) recorded that 9 cremations recovered from Teotihuacan are associated with “luxury goods in complex offerings;” these cremations come from a variety of apartment compounds, including Xolalpan, Tetitla, Yoyahuala, and La Ventilla (Sugiyama 2005:207). Thus, while Caracol’s S.D. C117F-1 does not match known Maya burial practices, it is consistent with interment practices noted for Teotihuacan apartment compounds (“the use of tombs for high-level elite burials” is *completely unknown* from Xolalpan-phase Teotihuacan” [Braswell 2003:137]). Thus, if Teotihuacan burial practices (in terms of grave form, grave location, and complexity of contents) are applicable to the Caracol situation, at least one of the individuals within the Caracol cremation was of high status.

Special Deposit C117F-1 can be interpreted in many ways. Minimally, it shows knowledge of and emulation of foreign ritual practices. Whether this is simply status reinforcement or something more is an unanswered question. Caracol’s Northeast Acropolis housed an important elite family in the Early Classic Period. Whether it was the paramount family is unknown. What its linkages were with the rest of the Maya area and Mesoamerica are not fully established. However, S.D. C117F-1 has ramifications for the interpretation of “power,” external linkages, and events both at Caracol and in the Southern lowlands during the Early Classic Period. Significantly, this deposit is coeval with others that show little or no ties with central Mexico.

Discussion and Conclusion

From the perspective of archaeological interpretation, considerations of status and power relating to S.D. C117F-1 are intertwined with conceptualizing the meaning of the deposit and its symbols. A small, round-cornered square burial pit in a central courtyard is an appropriate location

for a high status interment at Teotihuacan, but not for a high status burial in the Maya area. Cremation is consistent with a high status interment at Teotihuacan, but again not in the Maya area – at least during this time. In fact, cremations are not at all well documented in the Classic Period Maya archaeological record (but, see Adams 1999:62 for Rio Azul for an Early Classic example). The Caracol tomb located in the summit of Structure B32 better accords with what is known about higher status Maya interments. Yet, the artifactual contents of the cremation are far richer. The use of green obsidian points, a mirror, pottery miniatures, a censer, and a Thin Orange bowl would be consistent with a high status Teotihuacan burial; but, miniatures and censers are not common components of Maya interments. Thus, S.D. C117F is not representative of Maya burial practice or placement; it does, however, strongly resemble the practices and placement of a high status Teotihuacan interment.

This deposit may be associated with the concept of power in several ways. First, the positioning of the deposit in the center of a courtyard may be seen as a form of personal power, although this is not normally where a high status individual would be buried at Caracol. The foreign aspects associated with this burial also bespeak of personal power. The mirror included in the deposit may have been directly reflective of such personal power, especially if it formed part of a warrior’s costume (e.g., Sugiyama 2005:229), something also suggested by the inclusion of a possible atlatl tip (Figure 6). Special Deposit C117F-1 also speaks of power in terms of access to resources, both local in the form of the polychrome bowls and exotic in the form of the green obsidian artifacts, seas shells, and the hematite mirror. Power is also specifically manifested in the symbolic incineration of exceedingly valuable resources that made later re-entry and recovery impossible.

The external connections displayed in S.D. C117F-1 are consistent with earlier evidence for external ties reflected in the earlier burial of a female guised as Ix Chel a

short distance east of this deposit. The goods that accompanied this individual over 100 years earlier included ceramics that may have come from the Guatemala Highlands and a large number of jadeite and shell beads. Thus, residents of Caracol's Northeast Acropolis enjoyed a long and dynamic history of external connections, shedding some light on the importance of this site and its broader Mesoamerican connections. Realistically, S.D. C117F-1 evinces multiple aspects of this dynamic power: social power in the siting of the interment in an elite group; economic power in the availability and use of foreign goods; religious power in the incorporation of foreign burial practices into a Maya context; and political power in both the destruction of the goods that were placed in the interment (thereby removing them from circulation) and in the sanctification – even “Mayanization” – of high status exterior relationships.

In summary, while status and power are both abstract terms that vary depending upon relational situations and contexts, it is possible to view their inter-connectedness in the archaeological record. Conceptualizing and translating status and power into archaeological terms reveals both intriguing connections and potentially new structures for previously assumed developmental frames and relationships at Caracol. If one looks at the dating of S.D. C117F-1 in comparison to the hieroglyphic texts from the site, a possible correlation can be forged. Special Deposit C117F-1 dates to between A.D. 300 and A.D. 350 (impending radiocarbon dates may better position this). According to the hieroglyphic record contained on Caracol Ballcourt Marker 3, the dynastic sequence for the site was established in A.D. 331 (A. Chase et al. 1991; D. Chase and A. Chase 2008). Thus, it would appear that there could be overlap between the founding and the interment; minimally, the dating is close enough that each needs to be considered relative to the other. On one hand, then, the deposition of S.D. C117F-1 could simply have been a coincidence, having nothing to do with the

dynastic founding at Caracol. On the other hand, however, it could have been intimately related to the founding of the dynastic line. Given our knowledge of the archaeological record of the site and given the symbols associated with status and power reflected in S.D. C117F-1, we would be rather surprised if the placement of this interment in one of the more important Early Classic residential units did not have some direct bearing on epigraphic founding of Caracol.

Caracol became the largest known Maya site in the Southern lowlands. That it maintained connections with central Mexico at the start of its dynastic record is entirely appropriate. This early connection helps to explain and better contextualize Caracol's relationship with the dynastic founding of Copan, where Caracol is seen as being the donor of the ruling dynasty to its southern neighbor (Price et al. 2010). Even before the advent of the Early Classic Period, Caracol was intimately tied to trade and events that flowed through the Guatemala Highlands. The later connections seen in S.D. C117F-1 logically followed from these earlier relationships. Yet, the Caracol data raise other issues with the current interpretations of Teotihuacan relationships in the Southern lowlands, particularly with regard to trade-goods and inter-relationships. The distribution of items from central Mexico in the early part of the Early Classic Period thus far recovered from the Maya archaeological record may be suggestive of differences in early trade routes that may be related to status and power. The dating of the Caracol materials to the earlier part of the Early Classic Period, before A.D. 350, is also consistent with the Altun Ha situation. Thus, much contact with central Mexico archaeologically predated the epigraphic history generally attributed to Teotihuacanos (Clayton 2005; Stuart 2000), suggesting a much more complicated situation than the politicized story interpreted from the hieroglyphs.

But, these are topics for future considerations.

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2 **COMMON HOUSE, ELITE HOUSE, COUNCIL HOUSE: REPORT OF THE 2010 FIELD SEASON OF THE ACTUNCAN ARCHAEOLOGICAL PROJECT**

Lisa LeCount, Angela Keller, and John Blitz

This report summarizes the fieldwork conducted during the 2010 field season of the Actuncan Archaeological Project, the goal of which is to examine the processes that led to the institutionalization of kingship and state-level society during the Late Preclassic and Early Classic periods from B.C. 400 to A.D. 500. The project is investigating the centralization of authority from the perspective of household archaeology. We start with the premise that individual households would have participated differentially in kingly practices aimed at the centralization of power and authority. Some long-established families might have resisted royal strategies, while other families might have sided with leaders as a means to achieve greater socio-economic influence. Periods of highly centralized authority may correlate with archaeologically identifiable disruptions in long-term household growth and activity patterns, as well as an increase in socio-economic disparities between groups. This paper describes our 2010 excavations at Actuncan residential and civic areas, where deep excavations provide evidence for changing household layout and activities in response to increasing political centralization.

Introduction

The goal of the Actuncan Archaeological Project is to examine the processes that led to the institutionalization of kingship and the rise of state-level society during the Late Preclassic and Early Classic periods from B.C. 400 to A.D. 500. During this time span, many Maya sites became sufficiently large and complex to be considered archaic states. At Late Preclassic sites such as El Mirador and Tikal, monumental civic architecture was built at this time, including E-groups, ball courts, and pyramids that reflect the development of practices and institutions associated with complex political organizations. During the Early Classic period, the histories of the first royal dynasties were recorded in hieroglyphic texts at sites such as Tikal, and rulers at smaller centers, such as Actuncan, commissioned the building of palaces, courts, and temples.

To investigate the rise of Maya states, the Actuncan Archaeological Project is exploring the organizational changes that occurred in households coeval with the centralization of authority of a few local rulers. A household approach to understanding the rise of Maya kingship has rarely been attempted, since most researchers investigating emerging polities focus on the monuments and tombs of

rulers. The actions of rulers, however, cannot be fully understood without an understanding of the surrounding households that had long held kin-based power through their control of land, labor and ancestral sources of religious authority. Individual households might have participated differentially in kingly strategies to consolidate power since long-established families likely would have resisted mandates to relinquish resources, while upstart families may have sided with leaders to achieve greater socio-economic prominence. If leaders were able to usurp local kin-based power and wealth, and redistribute status and power to loyal followers, early statecraft should be marked by the fragmentation of large households and the appearance or expansion of others that look larger than expected given normal developmental cycles.

William Haviland's (1988) "household development cycle" is an important starting point for the development of a model of household responses to emerging polities. Haviland suggests that ancient households grew in size and composition as new members were added and domestic space was modified to incorporate them (also see Tourtellot 1988). Based on this model, archaeologists typically infer that single mounds housed nuclear families, while

larger groups were the homes of extended families occupied over generations. Work by Jason Yaeger (2000) and Cynthia Robin (1999) at patio-focused groups in rural communities near Xunantunich in the upper Belize River valley, such as Chan Nòohol and San Lorenzo, support this model.

However, there are significant problems with Haviland's model. First, his model attributes all household development to internal family dynamics, disregarding external factors such as political strategies that often profoundly reorganize household composition and practices. Elizabeth Brumfiel (1991) illustrates how increased tribute demands by the Aztec Empire fell especially hard on women, who responded by reorganizing household work to meet the new imperial demands. Some women specialized in the production of foods sold in markets, while other specialized in the production of cloth to pay tribute demand. In the Aztec case, centralized government policies resulted in increased household specialization and the reorganization of household activities.

Second, Haviland's model does not address the development and organization of elite monumental residential groups, such as those found at Copan (*sensu* Ashmore 1981). At the Copan site, elite residences, such as 9N-8 and 9M-22, are composed of a palace complex surrounded by multiple patio groups containing domestic, ritual, and ancillary structures. According to Julia Hendon (1991), Copan elites ranked family members and organized their residential group and household labor in distinctly different ways than families living in lower-status, patio-focused groups. Household growth and membership in monumental elite residential groups is expected to be more variable, since ties within and between families were based on a number of factors beyond natural family growth, including patronage.

Third, Haviland's model does not address the possibility that Maya elites established estates similar to those described by Levi-Strauss in his "house society" model (Levi-Strauss 1982, 1987; also see

Gillespie 2000). Levi-Strauss defines "houses" as corporate entities that organize members around social, political, economic, kinship, residential, or ritual structures. Archaeologists often focus on the physical structure of a house, itself, as a representation of the corporate entity; identifying grand residences with limited and segregated domestic spaces as corporate houses. There is an ethnohistoric precedent for inferring the existence of Levi-Strauss type houses in ancient Maya polities. Principle lineages of the K'iche' Maya referred to actual physical houses, and the powerful lineages that lived within them, as *nimja*, which means literally 'big house' (Braswell 2003; Carmack 1981). According to Robert Carmack (1981:157), the *nimja* title may have arisen during times of political expansion and competition for power in the Postclassic period; a situation analogous to the Late Preclassic period, when kingship was institutionalized across the Maya lowlands. Houston and McAnany (2003), however, have raised concerns about applying the house society model to all elite social groups. They suggest that a royal court model may be more appropriate for the uppermost, ruling stratum of Classic Maya society, who lived in large, agglutinated palaces, like those found in Tikal or Palenque. In these expansive stone residences, royalty likely lived alongside an array of people related by blood, marriage, and fictive ties, as well as temporary residents, and unrelated courtiers and royal favorites (also see Harrison 1999).

The developmental processes that shaped the architectural layouts of patio-focused groups, elite compounds, elite houses, and royal palaces are unlikely to conform to a single organizational model such as Haviland's developmental household cycle. Ancient households were not sheltered from the social, economic, and political dynamics that existed outside their walls. Furthermore, inside those walls, household membership may have been quite diverse and fluid. Periods of highly centralized authority may have resulted in the attenuation of previously powerful

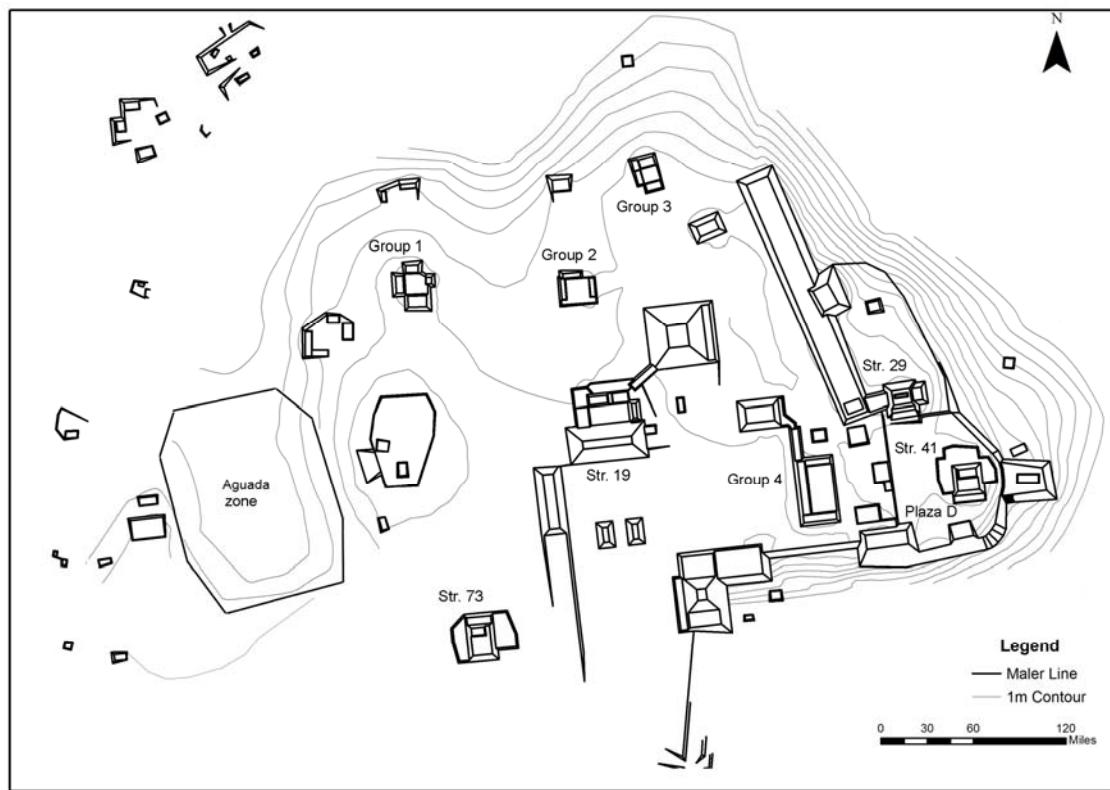


Figure 1. Revised Map of Actuncan North. Map by Don Perez and Angela Keller.

households and the proliferation of new forms of social groupings with social or political ties to kings. If so, then the institutionalization of kingship may be marked in the archaeological record by disruptions in long-term household growth patterns, the opening of a significant gap in household prosperity across groups, and development of elite houses. This chapter reports on our 2010 investigations in some of Actuncan's residential areas where our ongoing excavations provide evidence for changing household layout and activities in response to increasing sociopolitical centralization.

Actuncan

Actuncan is situated on a low ridge overlooking the Mopan river valley 2 km north of Xunantunich. The first systematic investigation of the site was conducted by James McGovern in the early 1990s under the auspices of the Xunantunich Archaeological Project (XAP). McGovern

(2004) mapped the 14 ha site using a total station, documented building sequences by profiling looters trenches in pyramids, and tested eight civic structures. He divided the site into two sections: Actuncan South, an acropolis-like temple complex, and Actuncan North, the Classic period civic center.

According to his work, the bulk of the temple complex was built in the Late Preclassic, and an early carved monument, Stela 1, was erected in front of the largest structure. Painted stucco masks adorned the main temple façade in the Early Classic reflecting the site's close connections with other Maya kingdoms. Using construction volumetrics, McGovern estimated that bulk of Actuncan North's civic architecture was built during the Early Classic period.

Our work at Actuncan North, which focuses specifically on households, has found a different pattern. All house mounds sampled so far were occupied in the Late and Terminal Classic periods. Additionally,

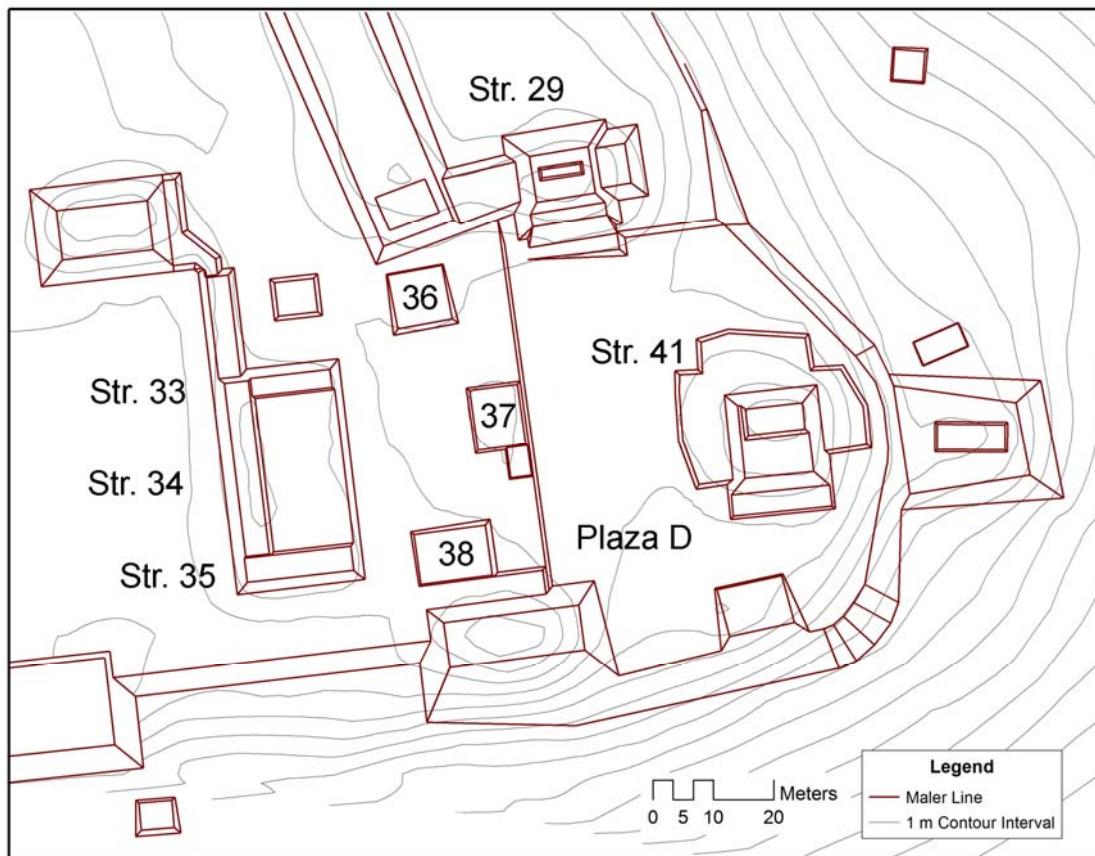


Figure 2. The Eastern Zone of Actuncan. Map by Don Perez and Angela Keller.

a courtyard platform behind Structure 19, the ostensible royal palace, was built entirely in the Late Classic. Although Actuncan is known locally as a Late Preclassic and Early Classic center, its role in Late and Terminal Classic political dynamics is likely far greater than previously assumed given its large urban population.

Field work 2010

Remapping Actuncan

When McGovern mapped the site in the early 1990s, the civic core was forested in dense secondary growth. Transects had to be chopped, and visibility was poor. Today, much of Actuncan North has been cleared for cattle grazing and farming making Actuncan's architecture more visible; therefore, remapping the site at this time was appropriate. We had two primary goals for

the 2010 mapping program: (1) to create a more detailed topographic relief map that could be used as a base layer for McGovern's Malerized drawings of the structures, and (2) to revisit important structures and architectural features in Actuncan North to better understand the layout of the site and residential groupings (Figure 1). All areas that were the focus of excavations---Group 1 (Structures 59, 60, 61, and 62), Group 4 (Structures 33, 34, and 35), and Structure 41---were remapped this year by Don Perez with some assistance from Angela Keller. In addition, a large swath of the northern civic center received considerable attention and some reinterpretation. Both topographic and architectural data are essential in interpreting the ways in which ancient peoples made use of the landscape.

Mapping began at Structure 41, a large structure that was the focus of excavations

discussed in depth below. Most significant was the discovery of a previously unmapped terrace appended to the southern edge of the structure. Upon closer inspection, we found that the terraces on all sides of Structure 41 were subtly misrepresented on McGovern's map. A similar representation problem was discovered at Structure 29, which was also remapped in 2010. Both of these structures were found to have similar layouts---a central pyramidal structure surrounded by low broad terraces---comparable to the architectural form McGovern identified at Structure 73 (Figure 2). Further, all houses of this form appear to be oriented at 8 degrees west of true north, as is most of the civic and residential architecture in Actuncan North. These residential mounds do not form part of typical patio-focused residential groups, and, currently, LeCount interprets them as elite houses.

McGovern represented the area east of Structure 41 as an oddly shaped platform appended to Plaza D that supported a rectangular structure. Our findings confirmed this, and we discovered an additional rectangular structure to the north of the appended platform. We also identified a small staircase that extends down the southern side of Plaza D immediately east of Structure 41. Terracing was also found off Plaza D on the southern and eastern slope of the Actuncan ridge. These modifications may be the result of subsistence activities associated with the residents of Structure 41.

To the west of Plaza C is an enigmatic area containing Structures 67, 68 and 69 and an *aguada* to the west. Upon remapping, Structures 67 and 68 were found to be situated on top of a rise that appears to have been modified to form a broad, low platform. Keller suggests that this area, and the level open area to the east of the low platform, may have been a market place, given the location and lack of architectural elaboration. From surface observation, the broad platform appears to be primarily earthen, but Keller and Perez identified a stone staircase extending off the southeastern corner toward the *aguada*

identified initially by McGovern in 1993. After a particularly hard rain during the 2010 field season, the *aguada* feature held water to a depth of approximately 15 to 20 centimeters. The extent of this water was approximately 20 m east-west by 30 m north-south. The *aguada* is large and roughly rectangular. To the north, the edges of the *aguada* are more difficult to discern and the feature appears to narrow. During the heavy 2010 rains, we noted subtle features at the northern extent of the *aguada* feature that seemed to act as a check to the flow of water. Perhaps a dike or check-dam feature was constructed in this area to control the flow of water held in the *aguada*.

Excavations at Group 1

In the 2010 field season, excavations continued at Group 1, a patio-focused group located northwest of the civic core, where excavations were conducted in 2001 and 2004 (LeCount 2004; LeCount and Blitz 2002, 2005; LeCount et al. 2005). Caroline Antonelli concentrated on exposing the front façade of Structures 62 and 61, the western and southern structures, as well as the patio space directly in front of them. Structure 62's terminal façade was constructed by placing a large cobble retaining wall along the exterior edge of the structure platform and facing it with small cut stones. This Late Classic building was built on an Early Classic patio floor that extends across the entire patio. In the Late Classic, a prepared dirt floor accumulated, or was constructed, over the plaster patio surface. Interestingly, near the southeastern corner of Structure 62 we found an informal construction consisting of a 1 m line of large cobbles, oriented east-west, and a tamped earth surface, which dates to the Terminal Classic period.

Structure 61, located to the south, is the tallest platform in Group 1. The front of this structure is poorly preserved, with large cobbles strewn over the entire structure. A trench into the center of the platform revealed a retaining wall that holds in place dry-laid, large cobble fill. Ceramics from this fill dates the final construction phase to



Figure 3. Chert Eccentric (Op6RR/1).

the Terminal Classic period. The Terminal Classic dirt floor found between Structures 61 and 62 is probably associated with the final construction and occupation of Structure 61. Beneath the large cobble fill, we encountered a Late Classic platform and nicely prepared front step made of small cut-limestone blocks. Apparently, the Late Classic structure was cut down to the first course of the stairs in order to build Structure 61-1st using dry-laid large boulders which were then faced with boulders. No cut-limestone blocks were associated with this final construction phase.

Kara Rothenberg directed excavations at Structure 59, located on the northern edge of the patio. Like the western and southern structures, Structure 59 was built atop the Early Classic patio floor, although a later prepared dirt floor, dating to the Late Classic period, is evident abutting the front of the structure. The platform is terraced along the southern extent of the building. Low, inset platforms or structural wings were appended to the eastern and western sides of the central platform of Structure 59 forming small work areas raised slightly above the patio surface. Artifacts from surface and use-related contexts at Structure 59 are abundant and varied. Along with ceramics, there are large amounts of lithic debris, ground stone, slate, ocher, bark beaters, obsidian, and ferruginous concretions. Given the diversity and moderate density of materials, this staged platform may have functioned as a multi-use workshop area.

Interestingly, although significant quantities of Terminal Classic period ceramics have been found at both the southern and western structures (Structures 61 and 62), Terminal Classic material is scarce at Structure 59. This suggests that

residents were not living or working on the northern structure, rather they appear to have focused their activities in the southern portion of the patio group.

Excavations at Structure 41

Structure 41 is a large elite house located on the eastern edge of Plaza D. In 2004, LeCount and Blitz (2005; LeCount et al. 2005) placed test excavations off the northern edge of the structure and identified two phases of plaster floor construction dating to the Early Classic period. During the 2010 field season, David Mixter supervised excavations at Structure 41 aimed at 1) defining the architectural arrangements and the developmental history of this household's architecture, and 2) determining the spatial organization of household activities over time.

The top of the pyramidal platform appears to have been modified numerous times in antiquity. During the final construction phase, the pyramidal substructure supported a large (southern) front terrace and a smaller (northern) upper platform. The terminal architecture on the top of the pyramidal platform was difficult to interpret. Beneath the humus layer, a level of expansive rubble and chert cobbles covers most of the upper platform or dais at the northern end of the structure. Cut blocks define the original southern edge of the dais, to which a 1 m extension was added during the Terminal Classic. In the Terminal Classic period, the Maya apparently created a large, multilevel platform on top of the pyramid. At some point, possibly as part of the final termination of the building, fine bifaces were finished on this structure. Excavators collected hundreds of small chert flakes concentrated on the top of the rubble. The flakes were associated with a chert eccentric (Figure 3) and two projectile points likely dating to the Terminal Classic period (Figure 4). Ongoing microartifact analysis may help clarify the Terminal Classic use of this structure.

Below the Terminal Classic construction, Mixter encountered a large Late Classic masonry structure with three



Figure 4. Coarse, Cryptocrystalline Projectile Point (Op6GGG/2).

doors and three benches facing south. A single step leads from the central platform up to the western door. The construction of the Terminal Classic extension to this upper platform appears to have destroyed the matching steps associated with the middle and eastern doorways; however, the eastern step's location was marked by large (50 cm in diameter) sandstone boulder. The western and central benches have been cleared, but the eastern bench proved to be enigmatic due to a complex palimpsest of renovations on that side of the structure. The central bench rests on top of a low plinth.

The nature of the Late Classic structure remains enigmatic due to the lack of evidence for standing masonry walls. Instead, this structure likely supported perishable *bajareque* walls, possibly footed into the edges of the benches and the plinth. The recovery of *bajareque* from surface and collapse lots on the structure supports this reconstruction. The entire surface of the upper dais was apparently plastered in antiquity, although few remnants of the plaster surface remain today. Stepping down to the south from the uppermost platform is a wide flat terrace that also appears to have been plastered. Near the southern extent of the terrace are two possible masonry wall stubs, the sole remaining indicators of a probable southern wall for the structure. Without the size restrictions of corbelled vaults, the Late Classic inhabitants of Structure 41 may have created a very large interior space with a

spacious front room and smaller, raised back rooms with low benches.

Excavations off the western edge of the pyramidal substructure revealed the construction of a possible wide stair or sequence of wide terraces that led from Structure 41's western terrace up to the top of the platform. The wall supporting the outer edge of the terrace was built with large, finely cut-limestone blocks.

As mapped, Structure 41 appears to face south. In the 2010 field season we tested this interpretation by placing a long axial north-south trench measuring 2 m wide by 16 m in length up the southern face of Structure 41. The trench revealed an unusual building style and a complex construction history. Although the pyramidal substructure does appear to be oriented south, facing the temple complex of Actuncan South, no staircase or cut-stone block faced terminal front façade was encountered. Rather, the terminal southern façade of Structure 41 appears to have consisted of a massive battened wall of boulders covered thickly with modeled stucco, at least some of which was painted bright red. The style and effect of this large stuccoed façade is reminiscent of the façades documented on Early Classic monumental architecture. Most of Structure 41's terminal southern façade has eroded, but a layer of large river cobbles covering some of the front and sides of the central platform remain. Remnants of stucco adhering to the cobble retaining walls suggest that the stucco was applied directly to a layer of fine ballast and soil packed between the river cobbles to form a sloped surface. Below this unusual cobble and stucco façade, Mixter encountered the penultimate construction phase. This earlier southern façade is also slightly battered, but unlike the Terminal Classic wall, it was constructed of cut-limestone blocks neatly fitted with small, cobble-sized stones. The wall was originally plastered, and remnants of the original plaster are preserved covering the façade in small patches.

Along the base of the southern face of Structure 41, Mixter identified two low terraces stepping down to a plaza floor.



Figure 5. Postclassic Jars Stylistically Related to Pozo Cream (Op8B/3 and Op6WW/2).

Based on ceramics within the terrace fills, the construction of the lower terraces dates to the early Samal phase (A.D. 600-670) of the Late Classic. The prevalence of later Hats' Chaak (A.D. 670-780) phase ceramics in the collapse above the lower terrace suggest that this surface continued to be used throughout the Late Classic. An Early Classic plaza floor runs under these terraces and also runs under the penultimate southern façade of the substructure described above.

In sum, the 2010 excavations at Structure 41 focused on understanding the subtle final construction phases of the building. During the Terminal Classic period, the Maya seem to have dismantled the Late Classic building to widen and level the platform. According to Mixter, this act may represent an intentional termination of the elite house or the creation of a ritual space associated with the construction of Group 4 to the west. The Terminal Classic construction features at Structure 41 lack the quality typically associated with Late Classic masonry construction. Rather than building with cut-stone blocks, the Maya built rough retaining walls of stacked cobbles and boulders that they then plastered over with a thick layer of stucco. This construction technique may be an indication of economic hardship or it may point to the development of a local façade style. The discovery of Structure 41-2nd shows that Structure 41 was at one time constructed using greater care and precision, as is typical for elite architecture of the Classic period.

Excavations at Structures 33, 34, and 35

The most unexpected discovery this year was the identification of a large platform supporting a C-shaped arrangement of

superstructural elements previously mapped as Structures 33, 34, and 35. The platform appears to be part of a group of structures that includes three small structures (Structures 36, 37, and 38), possibly shrines, in front and to the east of the main platform. The small structures face one another across a small, raised patio in the eastern portion of Actuncan North. The entire complex is separated from the residences in Plaza D by a low wall or step extending north to south from Structure 29 to Structure 39.

Before excavation, the complex seemed oddly placed in relation to the larger civic design of Actuncan and in need of exploration. Initially, LeCount was perplexed by the layout and positioning of the group, waffling between interpreting it as a residential group related to the other elite structures to the west or an oddly placed civic structure backing Plaza C and Late Classic monuments. While visiting the Actuncan Project, Richard Leventhal suggested that the oddly placed group might be a C-shaped complex, commonly interpreted as a Postclassic or Terminal Classic *popol nah* or council house (Bey et al. 1997; Rice 1986). Leventhal's inference is well supported by our work thus far.

Our assessment of the group as a C-shaped complex is based on the construction, design, and placement of the structures, as well as Terminal Classic and Early Postclassic diagnostics recovered in preliminary excavations here and elsewhere on the site (Figure 5). Similar platforms have been documented in late Terminal Classic to Early Postclassic contexts at numerous sites including Ek Balam in Yucatan, Seibal and Lamanai in the southern lowlands, and at island sites in the Peten Lakes region.

As with other Early Postclassic buildings and groups constructed within the confines of Classic centers, Actuncan's C-shaped building appears to sit within but apart from the Classic site. It is, more accurately, a site within a site: a new public space carved out of the earlier civic center. The surrounding Classic buildings are not incorporated into the design of the C-shaped

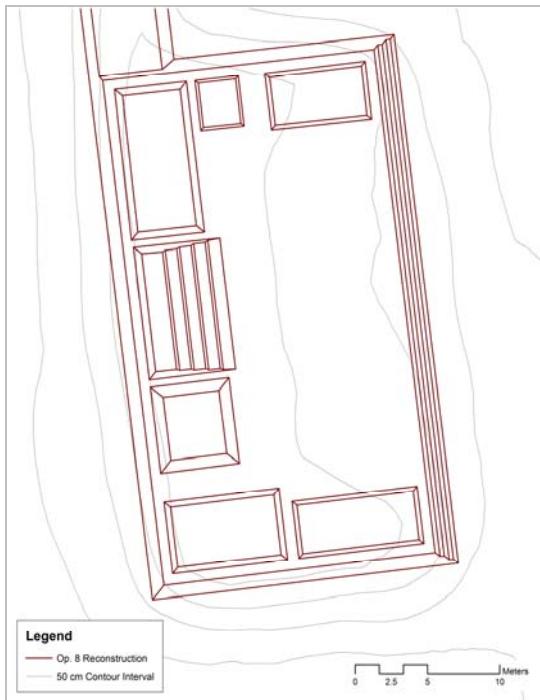


Figure 6. Reconstruction of Actuncan's C-shaped Structure. Map by Angela Keller.

complex as useable structural elements. Rather, the Classic buildings seem to serve as a potent landscape within which the Terminal Classic and Postclassic Maya constructed a new type of civic space using new architectural canons reflecting profoundly altered socio-political circumstances.

Becky Mendelsohn directed axial excavations atop the platform. Just centimeters below the present ground surface, her clearing excavations revealed a prepared surface that slopes gently up to the west toward Structure 34. The surface may have originally been plastered directly over a dirt and gravel ballast, although we found no plaster remnants in the 2010 clearing excavations. Alternatively, the sloping surface may have been finished with packed silt and clay (Rice 1986:305), which is prone to erosion. The sloped surface consists of carefully placed size-sorted fills. The uppermost fill is a fine-grained, wet-laid fill placed over a fill of medium-sized stones, which in turn rested on a large cobble fill.

To better understand the construction history of the C-shaped complex, we placed

a probing unit roughly in the center platform. The unit revealed a well-preserved Early Classic structure that was apparently truncated in antiquity and then completely engulfed by the Terminal Classic platform. The exposed portion of the Early Classic structure consists of a facing wall of tightly fitted cut-limestone blocks backed by a core of chert and limestone fill consistent with the construction techniques previously identified in Early Classic structures at Actuncan (McGovern 1994) and other sites (von Falkenhausen 1985:129). The cut-limestone facing stones are large, with most measuring between 40 and 60 cm in width and 15 and 20 cm in height. Wall courses are fitted with layers of chinking consisting of small limestone pieces roughly 5 to 10 cm in size. The structure seems to have been cut down prior to the construction of the Terminal Classic sloped surface above. Fine, light-colored, clay loam fill was packed against the wall and used for roughly the first meter of fill, presumably to aid in the preservation of the structure. Next, the builders laid four fill layers alternating between very large limestone-and-cobble fill and finely sorted silty loam soil before laying down the three uppermost size-sorted fill layers under the sloped surface as described above.

From surface inspection, the eastern edge of the platform appears to be a continuous stair, allowing unrestricted access to the platform. In places, the steps along the eastern platform edge can be identified as lines of large cut-limestone blocks, possibly robbed from Classic building façades elsewhere in the site. The apparent lack of mortar in this low stair is consistent with Terminal Classic and Early Postclassic architecture elsewhere, and it has resulted in its exceeding poor preservation.

We suspect that the C-shape superstructural elements found on top of the platform are actually several distinct smaller platforms, some with possible low benches (Figure 6). From surface inspection and limited clearing excavations, each of the platforms seems to differ slightly in height, size, and construction technique. Some

appear to be built with large cut-limestone blocks, others with small blocks, others with cut slabs, and still others with large river cobbles. This structural diversity suggests to us that these platforms were built by distinct groups, possibly individual lineages who came together in the Terminal Classic to build this structure.

Along the central axis of the western edge of the platform, which is also the highest portion of the complex, we identified the remains of an enigmatic superstructural feature constructed at the apex of the sloped surface. This structure consists of a concentration of severely eroded cut-limestone pieces of varying size, with as large as 50 cm in greatest dimension. Unfortunately the terminal architecture in this area is so poorly preserved as to be virtually unintelligible. Many stones have been upturned and displaced through the action of roots, cohune palms, and fallen trees. An apparent lack of mortar and possibly of plaster likely hastened the deterioration of the terminal architecture.

Conclusions

The 2010 season of the Actuncan Archaeological project focused on clearly defining the terminal architecture at a patio-focused group, an elite house, and a C-shaped administrative structure. All three groups demonstrate very different approaches to the organization of people and space.

Group 1, the patio-focused group, appears to conform to Haviland's household developmental cycle model, at least in part. The group was founded early in the Middle Preclassic period and grew in size and architectural complexity over many generations. However, based on our combined 2001, 2004, and 2010 excavations, we now know that the group did not grow consistently or predictably over time. It experienced two growth spurts: one in the Terminal Late Preclassic and one in the Late Classic. LeCount would argue that these growth spurts had less to do with internal family affairs and more to do with

political dynamics and how families cope with the external forces impinging on them.

The developmental cycle of Structure 41 also does not entirely conform to Haviland's model either. Based on our preliminary studies, we believe the structure to be a large, urban elite house. In its penultimate form, the house was a single, multi-roomed structure perched atop a high pyramidal platform flanked by low terraces that could have supported a variety of activities. The Late Classic architectural form of Structure 41 conforms to the physical description of an elite estate or house. This layout indicates highly segregated work and living areas reminiscent to those described by Folan and colleagues for elite structures at Calakmul (Folan et al. 2001). Extended family members may have lived and worked in the small structures and terraced fields to the east. The estate may have been founded as early as the Late Preclassic period, but certainly no later than the Early Classic period, and its inception speaks to the centralization of power at Actuncan and the interaction between rulers and households during this dynamic period.

In the Terminal Classic period, the relations between divine rulers and households soured and a new kind of political organization united the disparate groups located across the upper Belize River valley. Although our data are entirely preliminary, the diversity of platform construction in a C-shaped arrangement atop a large Terminal Classic platform oriented to the Actuncan 8 degrees west of north alignment suggest that the C-shaped complex was constructed by local peoples, not an invading force. The diversity of the superstructural elements speaks to a diversity of interests and traditions that would not be expected in a single invading group. Further, the orientation of the Terminal Classic structures matches that of the buried Early Classic building, as does the majority of the architecture in Actuncan North. The use of a common orientation also may indicate that the builders of the Terminal Classic complex were local people, converging on the center of

Actuncan to form a new confederated authority in a place with a deep history of local rule.

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3 **POLITICAL DYNAMICS IN THE MOPAN RIVER VALLEY: RECENT RESEARCH IN THE BUENAVISTA DEL CAYO HINTERLANDS**

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One important component of the Mopan Valley Archaeological Project has been the mapping of settlement traces around Buenavista del Cayo and the excavation of hinterland household complexes. In this paper, we present the results of these efforts to date. Mapping and extensive excavations in the settlement zone immediately south of Buenavista have revealed an occupation beginning in the Preclassic period, with a population peak in the Late Classic period, followed by a slight decline. This zone was home to poor and wealthy families, who were integrated into the larger Buenavista polity in part through activities in a larger administrative complex in the zone. We then turn to surveys completed northeast of the site core and across the Mopan River around Callar Creek. We describe the settlement clusters in these areas and the important clay and chert resources located during our survey. In our concluding synthesis, we pay special attention to what the distribution of settlements and the integration of settlement clusters and households tell us about the social status of hinterland residents and the heterogeneity of hinterland settlement clusters.

Introduction

The debate in Maya archaeology regarding the degree of centralization of Maya states has abated as many scholars have concluded that no single model can satisfactorily characterize all Maya states across time and space (Demarest 1996; Iannone 2002; LeCount and Yaeger 2010b; Marcus 1998; Sharer and Golden 2004). This new consensus has led to fruitful and focused studies of the political organization of various Maya states, and one approach scholars have employed is to examine the ability of a polity's rulers and institutions to shape the decisions and daily lives of its members. In this vein, the current phase of the Mopan Valley Archaeology Project (MVAP) seeks to reconstruct the complex relationships that linked hinterland households and communities to political capitals and their institutions, particularly as those may have changed or remained stable in the face of competition between those capitals (Yaeger et al. 2009). It takes as its case study Mopan River Valley and the major centers of Xunantunich and Buenavista del Cayo (hereafter simply Buenavista), located only 6 km apart (Figure 1).

Richard Leventhal and Wendy Ashmore (2004) have argued that the Mopan Valley

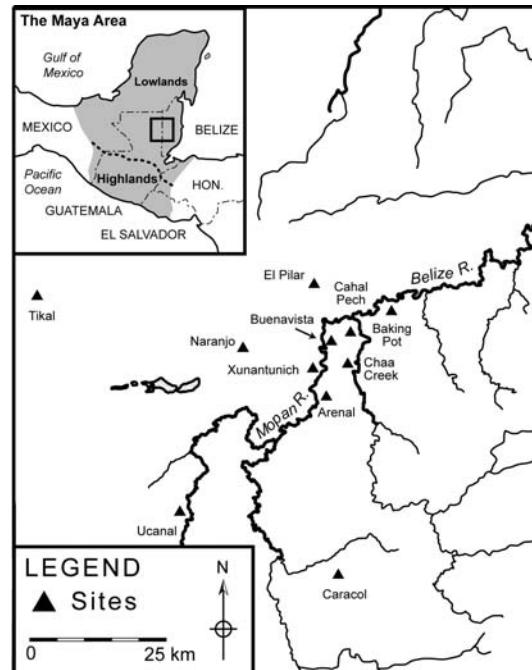


Figure 1. The upper Belize River Valley.

witnessed a succession of political centers beginning with Actuncan, then Buenavista, and finally Xunantunich. In a recent edited volume, Lisa LeCount and Yaeger (2010) and their co-contributors present the case that Xunantunich's political history was marked by early growth when the site was an autonomous political center, followed by a period of rapid growth while the site was

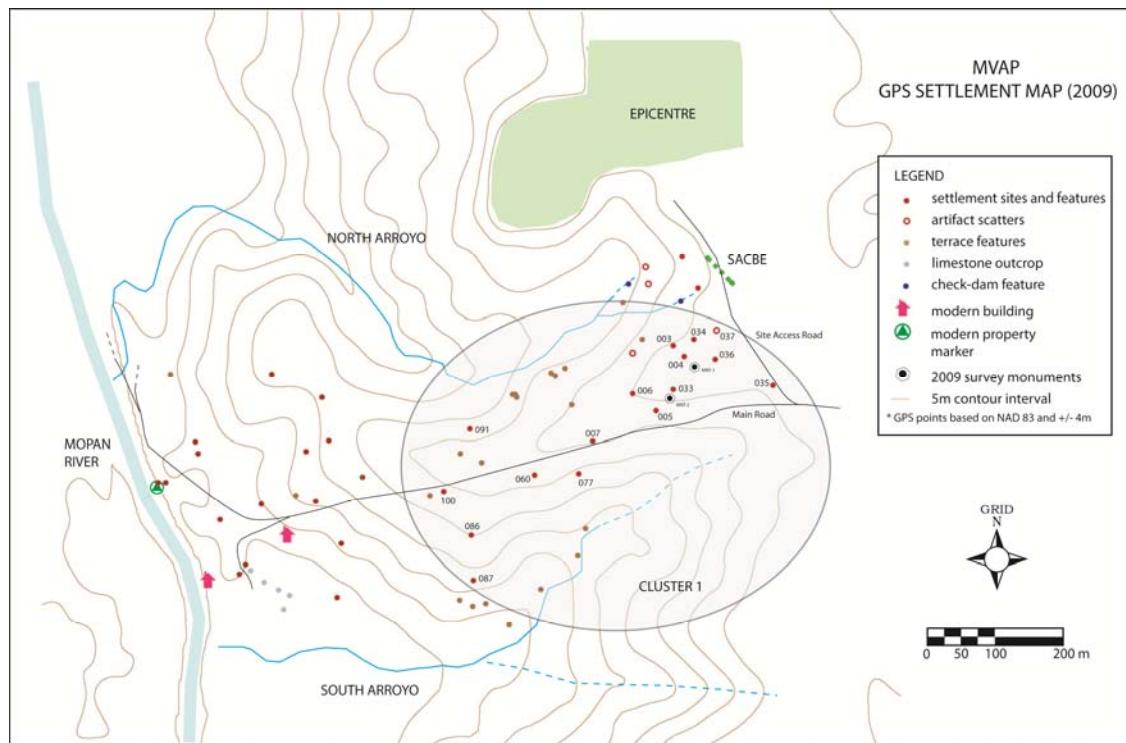


Figure 2. The Buenavista South survey zone.

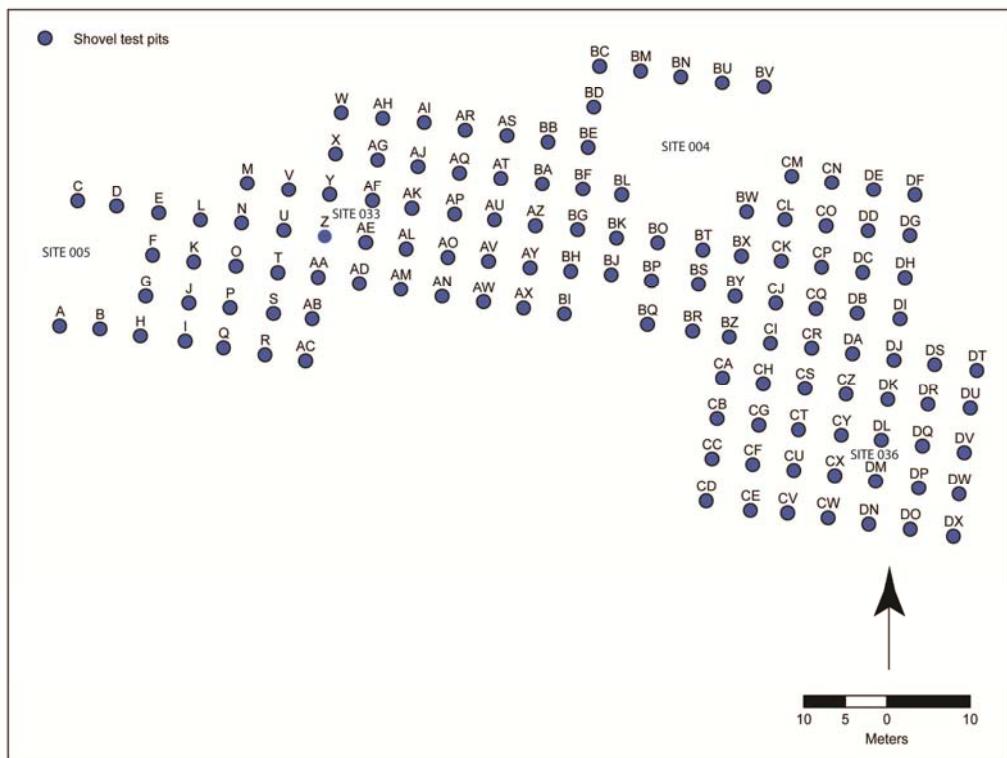


Figure 3. Placement of Op 353 test pits.

directly incorporated into Naranjo's kingdom as a provincial center around the turn of the 8th century (synthesized in LeCount and Yaeger 2010a). By the end of that century, the site was again an autonomous polity, possibly boasting its own emblem glyph (Helmke et al. 2010).

While the powerful kings of Naranjo may have been important figures in the valley's political history (also Leventhal and Ashmore; Taschek and Ball 1992; Helmke and Awe 2008; Houston et al. 1992), the rulers of Xunantunich also competed with their peers and neighbors for the Mopan Valley's rich resources and the labor and loyalty of its inhabitants. MVAP's current phase of fieldwork is particularly geared toward understanding how the valley's hinterland socio-political and economic dynamics shaped competition between Xunantunich and Buenavista during the Late and Terminal Classic periods, and how that competition in turn affected the valley's hinterland society.

After pilot work in 2005, we began annual fieldwork campaigns in 2007. The 2009 field season was the shortest of these, consisting of 5 weeks of fieldwork directed toward three investigation programs: (1) Bernadette Cap completed her study of Buenavista's East Plaza, which recovered convincing evidence that the East Plaza was the site's marketplace; (2) Meaghan Peuramaki-Brown continued her investigation of the social and political histories of two near-peripheral settlement clusters, located just south of the Buenavista site core; and (3) we began surveying in two other areas, one just northeast of the site core and the other on the opposite side of the Mopan River, north of Callar Creek. Because Cap discusses the East Plaza investigations elsewhere in this volume, we focus this article on recent investigations of the settlement zones around Buenavista.

Mapping and Excavation of Settlement Clusters South of Buenavista

The investigations of the settlement zone immediately south of Buenavista form Peuramaki-Brown's dissertation research,

which seeks to understand the socio-political decline experienced at Buenavista at the turn of the 9th century. Her primary research question asks how this civic decline was reflected in daily domestic identities and knowledge bases of residents living immediately around the Buenavista monumental epicenter (Figure 2). Peuramaki-Brown proposes the effect of the decline on daily life was minimal for the majority of near-hinterland residents, and that it was strongest in those households that had intimate ties to the ruling elite (de Montmollin 1995). She hypothesizes that differences in groups' experiences of the decline will demonstrate both the "high-politics" nature of the decline at the civic-ceremonial level and the endurance and guarding of *mētis*—that is, practical, experiential knowledge—within particular households and on a community level (Scott 1998). Her research focuses on the tension between collective and individual identities, as well as state and *mētis* knowledge bases, as one cause of transformation, and explores some of the many ways, scales, and forms in which society attempts to integrate differentiated identities into a cohesive whole. Such manifestations include differences and similarities in architecture and building practices, economic activity and craft production, ritual, burial practices, product and material access, and private versus public venues (Souvatzi 2008).

Peuramaki-Brown began her research in 2007 when she conducted a survey of a 0.35km² block of settlement immediately south and southwest of Buenavista's monumental core (Yeager et al. 2009, 2010). Within that zone, she identified two discrete clusters of mounds and associated features. After testing all sites within the larger of the two clusters, Cluster 1 (Figure 2), she began extensive excavations of a sample of the settlement sites in that Cluster.

The 2009 investigations were initiated with two particular goals: (1) to excavate three residential sites whose occupations extended into the Terminal Classic in order to gain information on the life-histories of these individual households; and (2) to

Site Type	Sites	Number	Frequency	Sites with Terminal Classic occupation
I: Single isolated mound, less than 2m in height	003, 004*, 033, 034, 035, 036, 077, 086, 087, 100	10	66.67	003, 004*, 035?, 036
II: 2 to 4 informally arranged mounds, all less than 2m in height		0	0.00	
III: 2 to 4 orthogonally arranged mounds, all less than 2m in height	005, 006*, 060, 091	4	26.67	005?, 006*
IV: 5 or more informally arranged mounds all less than 2m in height		0	0.00	
V: 5 or more mounds orthogonally arranged, all less than 2m in height		0	0.00	
VI: 1 or more mounds, with at least one between 2m and 5m in height	007*	1	6.67	007*
VII: 2 or more mounds, with at least one over 5m in height		0	0.00	
TOTAL		15	100%	

Table 1. Classification of Sites in the Buenavista South Cluster 1 using Xunantunich Settlement Survey typology (Ashmore et al. 1994). Asterisks indicate groups targeted for extensive excavation.

ground-truth an area of settlement that had been subject to ground-penetrating radar and conductivity analysis during the 2008 season by Bryan Haley of the University of Mississippi (Haley 2008).

Bailey Hudacin, an undergraduate student from the University of Calgary, supervised the ground-truthing program (Op 353) as part of an independent research project. She placed shovel test pits spaced every 5m in an off-mound area of Cluster 1 surrounded by four settlement sites (Figure 3; Hudacin and Peuramaki-Brown 2009). The patterning in artifact densities and cobble surface features that she identified led her to conclude the GPR and conductivity analyses were not successful in identifying sub-surface refuse deposits and architectural features. The reasons for this are unclear, although 2008 was a very wet season and it is possible the water saturated the area's clay soils and thus attenuated the radar waves of the GPR and overly

enhanced conductivity. Although Hudacin's ground-truthing was largely negative, we believe that further work under different weather conditions is merited, particularly given that remote sensing techniques did prove more useful in Buenavista's East Plaza. Hudacin's ground-truthing has also provided important potential information concerning the possible size of houselots and confirming the presence of undetected single low-lying mounds, plaster surfaces, and an area of craft production associated with a mound site (Site 005, see Peuramaki-Brown 2007).

The primary focus of work in Cluster 1 during the 2009 season was the initiation of extensive excavations at three settlement sites. A total area of 124m² was excavated over a period of 20 days with local excavators and University of Wisconsin field school students. Sites with occupations extending into the Terminal Classic phase were chosen from each of the settlement unit

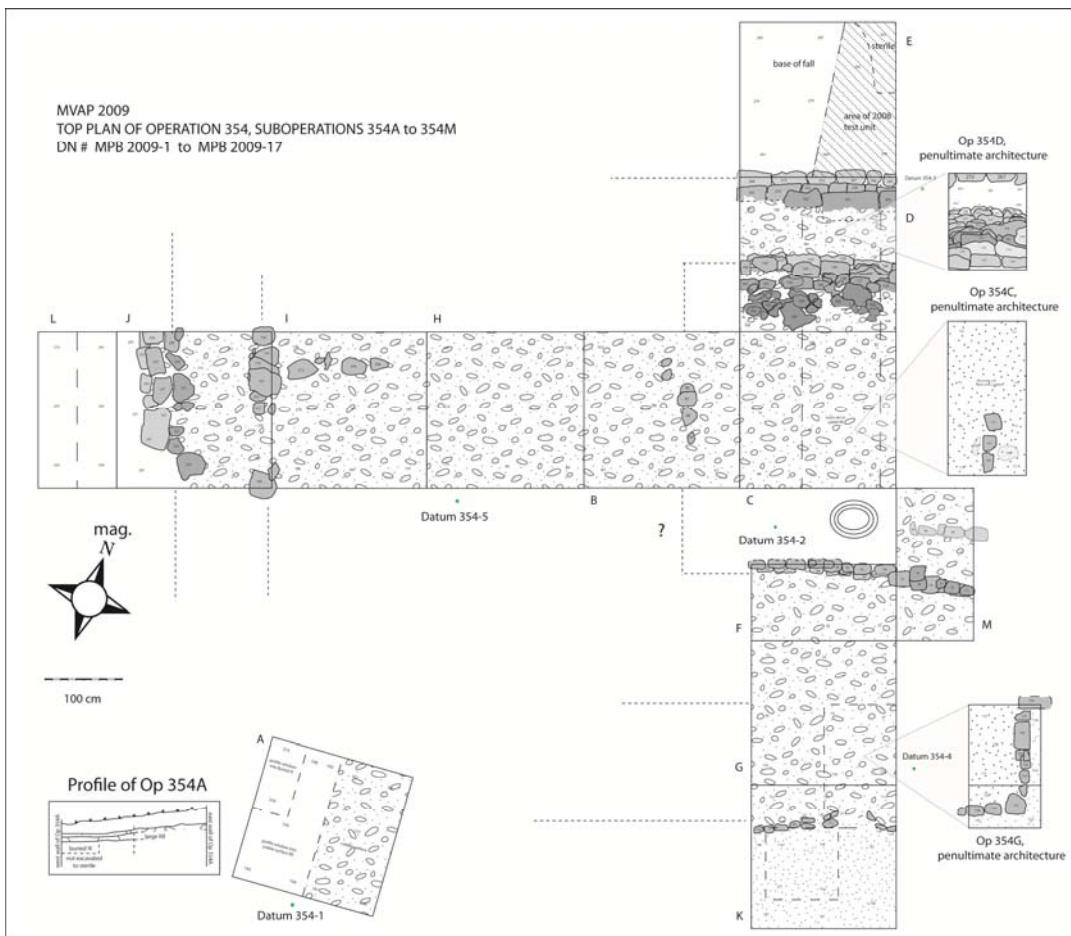


Figure 4. Top plan of Op 354 excavations in Site 007 Mound 1.

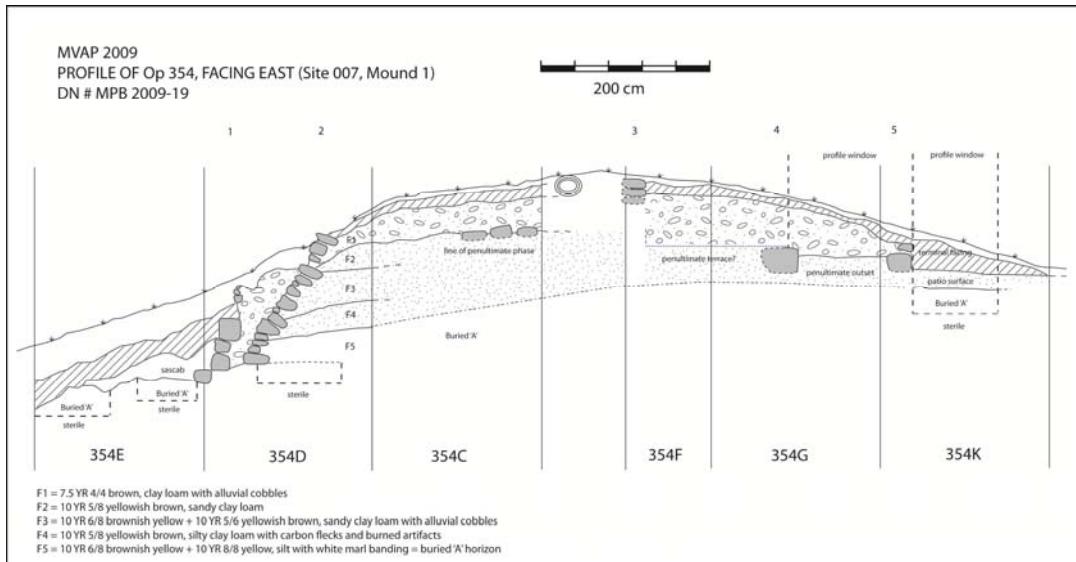


Figure 5. Profile of Op 354 excavations, facing east.

types represented in the Cluster 1 area (Table 1). Excavation units were laid out, generally in north-south and east-west running lines to provide quick “traverses” of each site. Peuramaki-Brown also aimed to expose at least half of each mound within a site, including areas to the rear and sides of mounds for the recovery of habitation debris deposits. Work was to continue at all three sites in 2010, but the subsequent plowing of two sites led to changes in the 2010 research strategy. Plowing in this area is particularly devastating due to the fact that the archeological features are found on and just below the ground surface. Formal analysis of all artifact materials is currently underway and will be fully reported in Peuramaki-Brown’s dissertation.

Site 007 is the largest settlement site in the cluster and is the only Type VI site represented (one or more mounds, with at least one being 2-5m high, see Table 1 for type definitions). It consists of two substantial, elongated buildings. 2009 excavations at Site 007 (Op 354) aimed to understand the layout, occupation, and function of the northern Mound, and excavations continued at both mounds in 2010 (Figure 4). Mound 1 is a platform with large, finely finished limestone block facings backed by roughly hewn core facings. The fill of the final construction phase, which dates to the Late Classic II (LCII) phase (roughly equivalent to the Hats’ Chaak phase at Xunantunich, LeCount et al. 2002), is dense in alluvial cobbles. The fills of earlier construction phases contain significantly less rubble material, consisting primarily of yellowish-brown clay, typical of fills in the cluster that date to the Early Classic and Late Classic I (LCI; roughly equivalent to the Samal phase at Xunantunich, LeCount et al. 2002) phases. The construction history of this building has proven far more complex than previously imagined, with the first phases placed during the Early Classic, and subsequent alterations in the Early Classic and LCI phases, and terminal additions in the LCII phase, including a formal patio area on its south face (Figure 5). Use of this building extends

into the Terminal Classic (TC; roughly equivalent to the Tsak’ phase at Xunantunich; LeCount et al. 2002). This occupation history is interesting when contrasted with Mound 2, which is constructed and occupied only during the Early Classic and LCI phases. After it was abandoned, its limestone facings and portions of the core face were apparently stripped for use elsewhere.

The artifacts recovered from Site 007 suggest a residential function, and residents were apparently relatively wealthy, as they had access to rare materials such as green obsidian, jadeite, and fine polychrome pottery with hieroglyphic texts. The unusual size and layout of Site 007, as well as its artifact assemblage could also reflect additional community-oriented activities and administrative functions. In this light, it is interesting to note that this site is located at a natural narrowing of the ridge, and the easiest access to Buenavista’s epicenter from the river would have passed through Site 007.

Site 006 is a Type III settlement site (two to four mounds orthogonally arranged, all less than 2m high), consisting of three low mounds built around a formal, built-up patio. We excavated 60m² of this site in 2009 (Op 355; Figure 6). Excavations were expected to continue in 2010, but this was cancelled after the area was plowed. The site’s platforms are composed of soft limestone facings and alluvial cobble fill, with earlier fills containing significantly fewer cobbles. Mound 1 is believed to be the principal residence of the site, due to its height and multiple construction phases, which span from the Early Classic to the LCII. The formal patio area, along with Mounds 2 and 3 were later additions in the site’s history and consist of single phases of construction. Occupation of the site continues into the TC. Although no earlier phases were uncovered in Mound 2, it was built on a solid layer of refuse, primarily ceramics, which sits directly on the buried occupation horizon. This material is likely associated with occupation of the penultimate and antepenultimate phases of

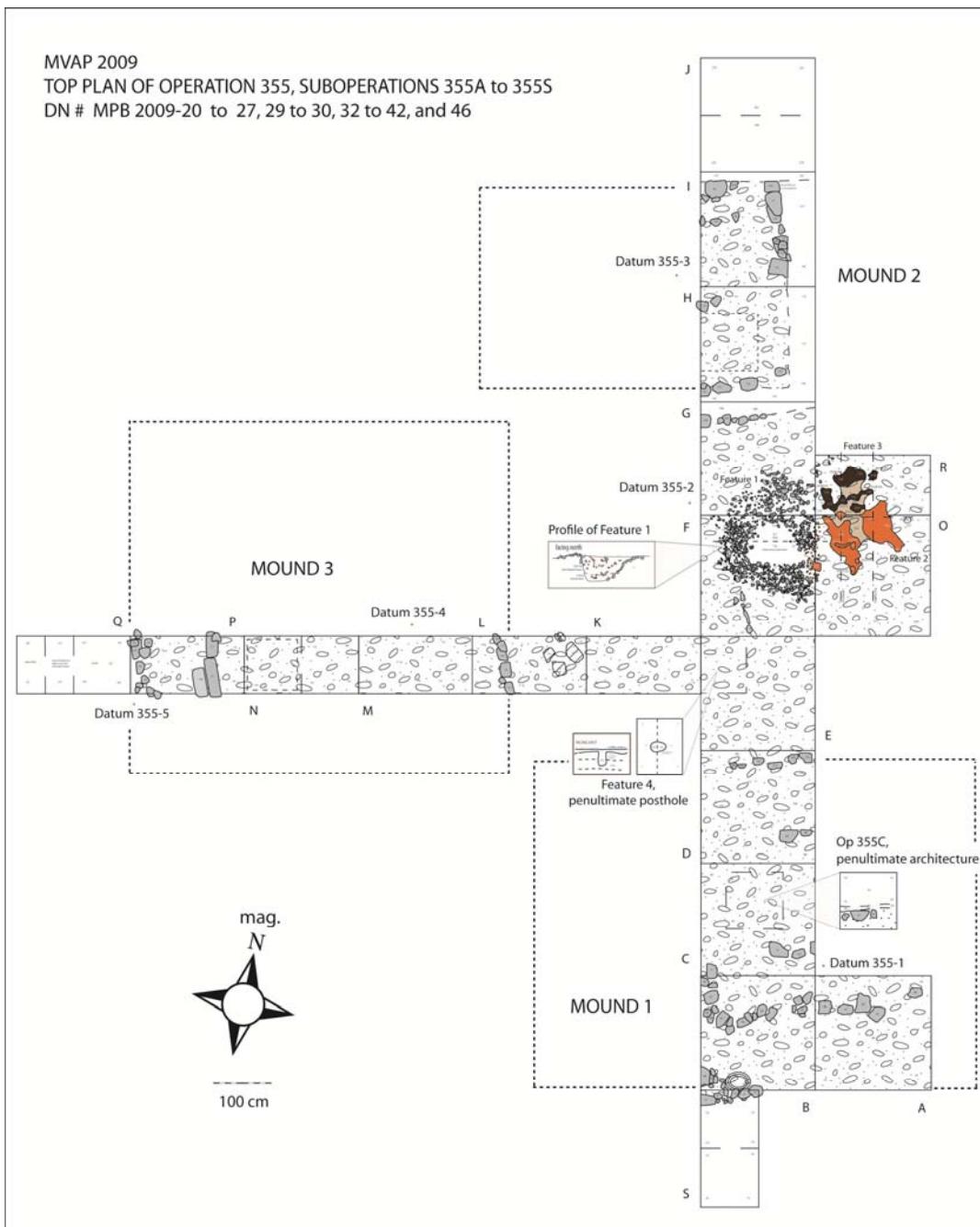


Figure 6. Top plan of Op 355 excavations in Site 006.

Mound 1, with ceramic material ranging in date from the Late Preclassic through the LCI phase. Three associated features were also uncovered on the final patio surface of Site 006. These included a firing feature (perhaps a hearth or oven), a separate fired clay feature, and a deposit of carbonized wood. The firing feature consists of a

cobble circle elevated slightly above the patio surface. The interior of the circle is a pit, filled with a mixture of soil, charcoal, small pieces of daub, and pebbles. The pit is roughly 65cm by 90cm in diameter and 40cm deep. It is partially lined with cobbles and cuts into the buried horizon beneath the patio, possibly associated with earlier levels

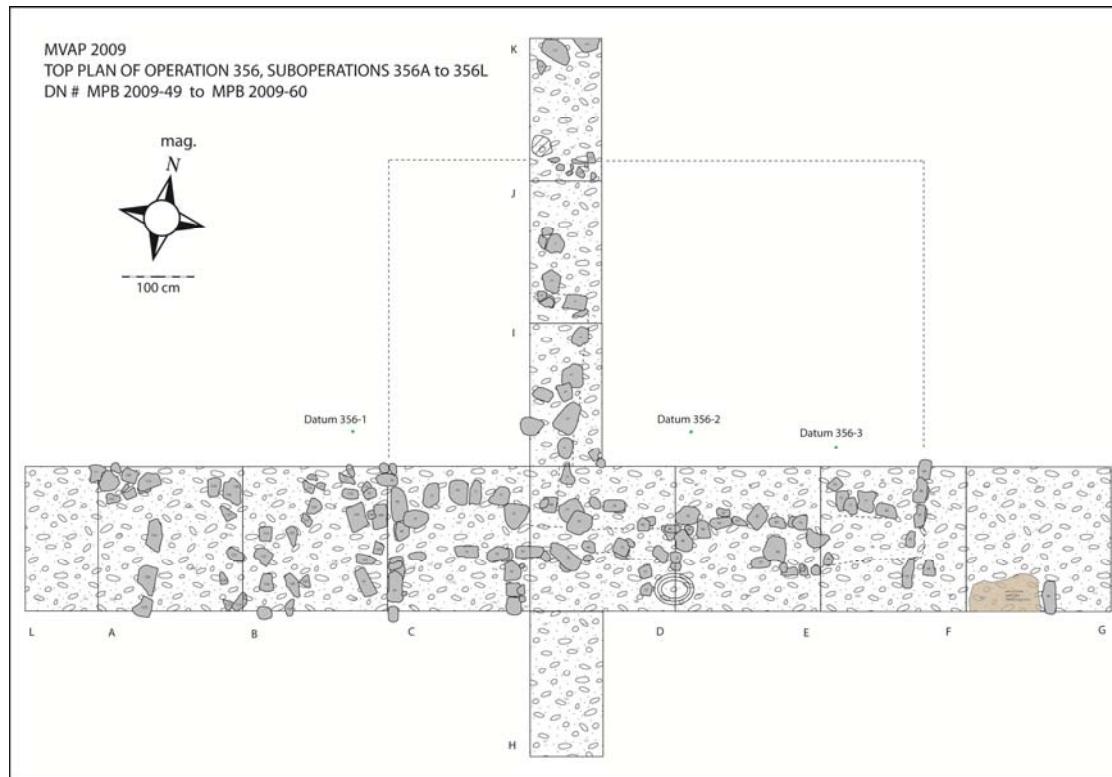


Figure 7. Top plan of Op 356 excavations in Site 004.

in addition to terminal activity. The feature was initially thought to be a hearth, but the lack of ash layers and its significant depth argue against an oxidized firing location. Peuramaki-Brown believes this may be the basal portion of an earth oven *pib*, pit-hearth, or smudge pit that was continually cleaned out (Binford 1967). An enigmatic “fire pit” described at Barton Ramie (BR-64) is similar to that of Feature 1. It was roughly 1m in diameter and 1m deep and “...contained dark refuse, loose soil, and rock chips...at the bottom...a deposit of large sherds associated with a great many lumps of burned clay [penultimate habitation debris in Op 355H and Feature 2]” (Willey et al. 1965:186; square brackets are additional comments by Peuramaki-Brown). It was concluded to be a garbage pit, but may have been something akin to the Rio de On fire pits (Masson 2000:86). The possibility of activity associated with ceramic production, in addition to functions mentioned above, will be assessed during formal analysis.

A large concentration of daub was uncovered immediately east of the firing feature. This daub layer was 20cm thick on average and rested atop the patio surface. During excavations a curved piece of daub was recovered of the correct length and curvature to either be a fragment from the inside of the firing pit, or to part of a clay superstructure that capped the feature.

Adjacent to the daub pile, a concentration of charred wood was recovered resting directly on the patio surface. The direct stratigraphic and spatial association of this wood with the firing feature and daub layer suggests it was behaviorally related. This may have been charcoal produced in the firing feature, or to be used as fuel. Further analysis of the wood is planned for the near future, including species identification and C14 dating.

The third site investigated in 2009 was Site 004, a Type I settlement site (isolated mound, less than 2m high), with adjoining terraces to the west, east, north, and possibly

south. Testing in 2007 dated its occupation from the Middle Preclassic through the TC. In 2009, a total of 38m² was excavated (Op 356; Figure 7). In 2010, we continued excavating the lower strata, although the uppermost layers had been badly disturbed due to plowing. The platform is composed of roughly hewn soft limestone block facings and alluvial cobble fill. Many lines of architecture were encountered during excavations, but their extreme proximity to the surface has led to much disturbance. An eastern terrace area was first identified during the 2007 testing, and further exploration of this area has uncovered many multiple mano and metate fragments, including rough blanks, suggesting craft production at this locale.

Plowing in the area around Site 004 has emphasized the proximity of this mound to two others, Sites 003 and 034. Site 003 was occupied during the LCI and LCII phases, with construction during Early Classic/LCI phases. The latter was constructed and occupied solely during the Late Preclassic to Early Classic. Because they are spaced just over 25m apart, they are designated as distinct sites according to the Xunantunich Settlement Survey (XSS) site typology, although their orthogonal arrangement relative to each other is of interest and suggests continuity between their occupations.

Testing and excavations by Peuramaki-Brown in the settlement to-date have provided the following understanding of Buenavista's occupation history. During the Middle and Late Preclassic periods, we see the first households established within the Buenavista South settlement zone, roughly contemporaneous with the Middle Preclassic founding of the site core (Ball and Taschek 2004). These are typically single mound sites, although some developed into multi-mound sites over time, and they tend to be located on the upper most shelf of the cluster area. Whether due to natural population growth and household fissioning, and/or immigration, new residential sites are established during the Early Classic period, while activity in the epicenter is picking up

significantly (Ball and Taschek 2004). It is during this time that possible residences or community-oriented buildings are being sponsored in the core area (Site 007), possibly as a means of tying these communities to life in the epicenter.

During the LCI phase, we see a boom in architectural construction in the epicenter (Ball and Taschek 2004), and all sites but one within Cluster 1 are occupied by this time. The LCII phase sees the continuation of settlement occupation and activity in the epicenter, but by the turn of the 9th century, large construction projects are abandoned in the epicenter (Ball and Taschek 2004). Some settlement sites are abandoned by this time as well, particularly those established later in the settlement's history. Site 007, which arguably was closely tied to the Buenavista rulers, was also abandoned, although some reoccupation/reuse is noted during the TC period. During the TC phase, a few groups continue to be occupied, primarily those established earliest in the cluster's history. There is no evidence of occupation extending beyond the 9th century.

Mapping of Settlement Zones Northeast and West of Buenavista

In 2009, we surveyed two additional settlement zones, one immediately adjacent to Buenavista and the other located across the Mopan River (Figure 8). The first began at Buenavista's East Plaza and extended north and east to a deep arroyo that skirts around Buenavista's east and north edges. Our surveys employed the methodology established by the Xunantunich Settlement Survey (Ashmore *et. al.* 1994). Because we have not yet tested the sites or mounds, we cannot draw any conclusions about the settlement histories of these different zones.

Christina Dykstra led a crew that surveyed some 25 ha just northeast of Buenavista. With this survey, we sought to contextualize the East Plaza within its larger settlement universe, complements Peuramaki-Brown's previous investigations immediately south of Buenavista, and search for chert production loci. The survey documented a sparsely inhabited zone,

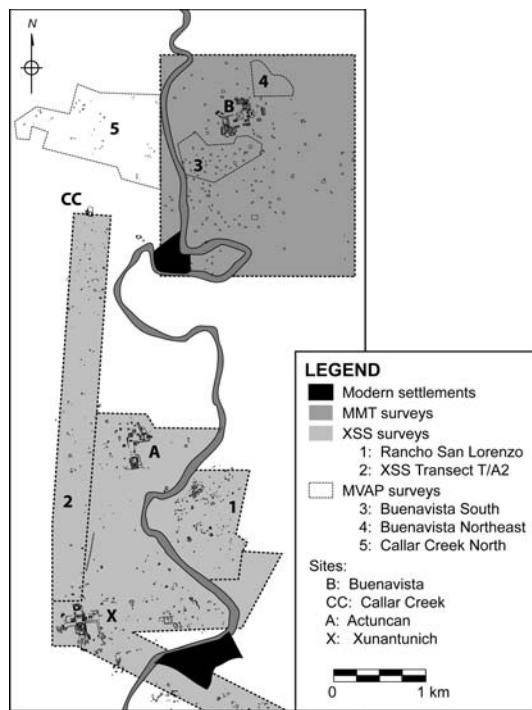


Figure 8. The Mopan Valley, showing survey zones discussed in text.

recording only 5 sites that contained 8 mounds in total (Table 2).

Although our survey did not find any evidence of chert extraction or intensified production of stone tools, it did identify a large quarry near the bank of the arroyo where a fine, white sediment was being extracted. Although experimental work is required to confirm this, we tentatively suggest that this material was used in the production of the cream polychrome pottery that Joseph Ball, Dorie Reents-Budet, and their colleagues have demonstrated to have been fabricated at Buenavista (Ball 1993, Reents-Budet 1994, and Reents-Budet et al. 2000).

On the opposite bank of the Mopan River from Buenavista, Sarah Kurnick led a crew that surveyed 161 ha and mapped a total of 72 mounds in 31 sites (Table 2). This survey zone began around Buenavista and ran south toward Callar Creek (Figure 8). This survey has two goals. First, it seeks to determine whether a pattern of settlement abandonment first identified by Jennifer Ehret (1995) just south of Callar Creek had parallels to the north. Ehret

found that 90% of the residential groups in the settlement zone just south of Callar Creek were abandoned during the LCI, at a time when competition between a surging Xunantunich and the older Buenavista polity would have been heightened. Through testing in future seasons, we plan to examine whether a similar abandonment exists closer to Buenavista. Second, we seek to provide a hinterland settlement context for investigations at the minor center of Callar Creek, where Kurnick has now begun her dissertation research.

Touching again on matters of craft production, we unexpectedly discovered a large chert quarry on a hill-top near Callar Creek where large beds of chert nodules are eroding from the ground surface. Informal observations of the associateddebitage suggest that the quarry was the locus of initial selection of raw materials, which entailed some initial-stage reduction. No finishingdebitage was noted, however, suggesting that higher quality nodules and/or rough blanks were taken elsewhere for fabrication of tools and cores. This is the largest chert quarry documented to date in the Mopan Valley. A large patio group with an ancestor shrine located immediately adjacent to the quarry may be the home of the household that controlled this economically important resource.

Discussion

The growing body of settlement pattern data in the Mopan Valley collected by MMT, XSS, and now MVAP allows us to identify some interesting patterns. The first involves settlement density, our best proxy for population density. Table 2 shows that the area immediately south of Buenavista is much more densely occupied than the two other zones that MVAP has surveyed around Buenavista, and its settlement density is higher than XSS's Transect T/A2, which runs north from Xunantunich through the Mopan Valley. Indeed, it compares favorably with the highest settlement densities known in the Mopan Valley, those of the area within 500m of Xunantunich and the Rancho San Lorenzo survey zone.

Survey Area	Number of Mounds	Area Surveyed	Mound Density
<i>Buenavista</i>			
Buenavista South Clusters 1 & 2	41	33 ha	124 str / km ²
Buenavista Northeast	8	25 ha	32 str / km ²
Callar Creek North	72	161 ha	45 str / km ²
<i>Xunantunich</i>			
Xunantunich, 500m radius	66	47 ha	140 str / km ²
XSS T/A2	151	153 ha	99 str / km ²
Rancho San Lorenzo	110	86 ha	128 str / km ²

Table 2. Settlement Densities in Selected Survey Areas in the Mopan Valley. Comparative data drawn from Yaeger 2003.

Site Type	BVS1	BVNE	CCN	T/A2	RSL
I: Single isolated mound, less than 2m in height	67%	60%	35%	52%	62%
II: 2 to 4 informally arranged mounds, all less than 2m in height	0%	20%	29%	26%	15%
III: 2 to 4 orthogonally arranged mounds, all less than 2m in height	26%	20%	23%	17%	20%
IV: 5 or more informally arranged mounds all less than 2m in height	0%	0%	0%	0%	0%
V: 5 or more mounds orthogonally arranged, all less than 2m in height	0%	0%	3%	0%	0%
VI: 1 or more mounds, with at least one between 2m and 5m in height	6%	0%	10%	1%	3%
VII: 2 or more mounds, with at least one over 5m in height	0%	0%	0%	1%	0%

Table 3. Composition of Selected Survey Areas in the Mopan Valley using Xunantunich Settlement Survey typology (Ashmore et al. 1994). Survey areas are Buenavista South Cluster 1, Buenavista Northeast, Callar Creek North, XSS T/A2, and Rancho San Lorenzo. Comparative data drawn from Neff et al. 1995 and Yaeger 2000, 2003.

In contrast, the Callar Creek North and Buenavista Northeast survey zones show strikingly low population densities. Bernadette Cap (personal communication, 2010) has pointed out that the area immediately north of Buenavista is characterized by poor soils, which may be one cause of the low settlement density there. In the Callar Creek North zone, relic channels of the Mopan River are clearly visible on the ground surface and through ORI data. Their location suggests that a significant portion of the alluvial bottomlands in the Callar Creek North zone was subject to alluvial deposition and cutting, which may have erased many settlement traces there, as was also the case in parts of the Rancho San Lorenzo survey zone (Holley et al. 2000).

The various settlement zones mapped in the Mopan Valley also show striking differences in settlement composition. Table 3 compares the kinds of sites found in different zones, using the typology developed first by the XSS. The Buenavista Northeast and South zones are quite similar to the Rancho San Lorenzo area, containing a relatively high frequency of single mounds (also Ashmore et al. 1994; Ford 1990). The Callar Creek North zone, in contrast, has a very low frequency of isolated mounds. It also has a higher frequency of multi-mound groups with mounds over 2 m in height. If the same correlations between occupation longevity on the one hand and group size and height on the other that have been observed at San Lorenzo (Yaeger 2000) and Buenavista South hold, these differences suggest that the Callar Creek North households had longer occupation histories, and more importantly, that they had access to sufficient resources to support larger, extended family households. Presumably the rich alluvial floodplain soils were of prime importance in that regard.

In sum, MVAP research demonstrates that settlement clusters in the Buenavista hinterland were quite heterogeneous, including richer and poorer residents, many of whom were involved in some forms of craft production. In most clusters, wealthier

residents had preferential access to important resources, including productive resources like land and chert toolstone, and political resources like ties to the polity's ruling elite and associated institutions (also Robin et al. 2010). Further survey and extensive excavations in other settlement clusters promise to yield a richer, comparative perspective on the relationship between macro-political competition in the valley and the changing organization of hinterland households and communities.

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4 HOUSEHOLDS AND SOCIAL TRAJECTORIES: THE SITE CORE COMMUNITY AT MINANHA, BELIZE

Matthew Longstaffe and Gyles Iannone

Over the span of its history, the ancient Maya city-state of Minanha underwent dramatic changes in its political, economic, and social environment, marked by the establishment of a royal court during the Late Classic period (AD 675-810). Three years of housemound excavations in the Site Core of Minanha has generated a robust data set of fine enough resolution to address the many factors that contributed to the social, political, and economic dynamic of, not only this particular settlement, but also, the center as a whole. The material inventory and nature of the Site Core settlement indicate that, throughout its existence, this community was richly textured, inhabited by an array of individuals and families engaged in a range of different economic activities, socio-political relationships, diverse ritual practices, and with differential access to resources. As an avenue of inquiry, exploring the integrative strategies of the Site Core households, from their initial occupations to their abandonment, has clarified the response this commoner community had to both the rise, and the fall of the Minanha city-state.

Introduction

The study of households is one of many avenues of inquiry pivotal to understanding the diverse factors that contributed to, and structured, the social, political, and economic dynamics of ancient communities (Ashmore and Wilk 1988; Canuto and Yaeger 2000; Iannone 2006a; Iannone et al. 2007; Longstaffe 2010; Lucero 1994; Robin 2003; Trachmann 2007; Yaeger 2000). Understanding the dynamics of households is of particular benefit to archaeologists, as households, in the past as they are today, were one of the basic social units of human society (Robin 2003). They participated in production, consumption, and in the reproduction of societal and cultural norms. In this regard, the study of households presents a robust and fulfilling window for understanding not only the fundamental role these social units played in structuring ancient communities in general, but also the integrative socio-political and economic roles imbued into the everyday lives of the people who constituted them (Canuto and Yaeger 2000; Robin 2003; Yaeger 2000). By highlighting the integrative behaviors that created bonds between households, the broader social dynamics that resulted in richly textured communities can be understood.

Ancient Maya communities were composed largely of commoner individuals (Ashmore and Wilk 1988; Lucero 1994;

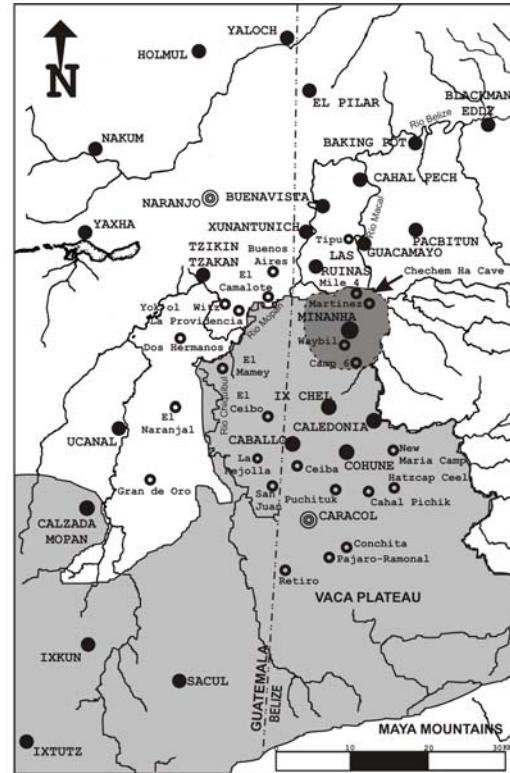


Figure 1. Map of the North Vaca Plateau, showing the location of Minanha (source: Social Archaeology Research Program).

Marcus 2004; Robin 2003). These individuals and their families structured their daily rhythms around their households, engaging in various integrative strategies to ensure a continued subsistence base, and fulfill obligations to their communities (Yaeger and Robin 2004). Although many

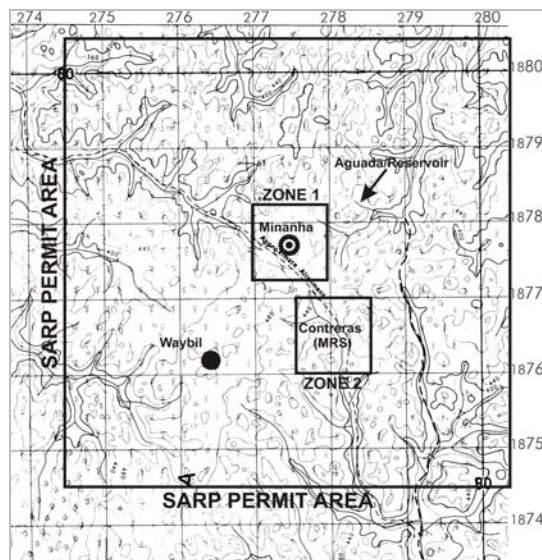


Figure 2. Map of SARP Phase II settlement zones, showing location of the “Site Core” and “Contreras Valley” zones (source: Social Archaeology Research Program).

of day-to-day actions of individual households were self-serving in nature, for example, subsistence agriculture, cooking, or the production of basic utilitarian goods for household use, these activities were fundamental in forging not only a collective identity, but also ensuring the wellbeing of the community as a whole. Regardless, in many cases, the successes and failures of households, and also the community as a whole, were mediated by the ability of individuals and families to react either positively or negatively to both short – sometimes dramatic – and long-term changes within the community. As commoner households were often the first to react to social or political changes within the community, their material records reflect the broader socio-political dynamics of the site as a whole.

At Minanha, Belize, a royal court was established at some point during the early 8th century. This Late Classic royal court flourished for roughly a century, and then like those at many Lowland Maya city-states, collapsed (Iannone 2005, 2006b). The imposing physical nature of this towering royal court complex was unquestionably venerable when viewed from the perspective of the lesser-status members

of the broader Minanha community. As part of an overarching settlement study, Trent University and the Social Archaeology Research Program, directed by Gyles Iannone, conducted three years of housemound excavations in the Site Core of this ancient Maya center (Figure 1; Iannone 2006a; Iannone et al. 2006; Iannone et al. 2007; Longstaffe 2009, 2010; Mosher and Seibert 2006; Seibert 2007). This research was designed as a companion to a “top down” study of Minanha’s social and political dynamics, gauging the response of both the “rise” and “fall” of this city-state from the perspective of its non-elite, proximal support population (Iannone 2005, 2006a).

Minanha’s Site Core Zone is a 1 km² area inclusive of the royal courtyard complex and site epicenter, but also includes its immediately surrounding settlement, located on natural terraces ringing the site epicenter (Figure 2). In order to accurately represent the built-environment of Minanha’s Site Core settlement, a 20% random stratified sample of the 39 known settlement units in the Site Core Zone were selected for excavation – these settlement units designated types according to the settlement unit classification scheme developed by the Xunantunich Archaeological Project (Ashmore et al. 1994; Table 1, Table 2, Figure 3). These excavations and artifact analyses have since resulted in a robust data set of significant enough resolution to develop a nuanced understanding of, and to address those many factors that contributed to, the social and political dynamics of not only this settlement, but also Minanha as a whole.

The material inventory and nature of Minanha’s Site Core settlement indicate that, throughout its existence, this community was inhabited by a diverse, and richly textured array of individuals and families engaged in a range of different economic activities, diverse ritual practices, and with differential access to labour (Longstaffe 2010). Tracing the social trajectory of Minanha’s Site Core house-

Type	Total # in Zone	Identified Settlement Units Within the Site Core Zone	Total # in 20% Sample	Randomly Selected Settlement Units
I: isolated mound (less than 2 m high)	10	70, 100, 119, 120, 130, 134, 137, 147, 150, 158	2	134, 137
II: 2-4 mounds (informally arranged; all less than 2 m high)	6	AC, AD, AF, AJ, AL, AN	1	AC
III: 2-4 mounds (orthogonally arranged; all less than 2 m high)	18	N, O, P, T, V, X, Z, AA, AB, AE, AG, AH, AI, AK, AP, AQ, AR, AS	3	V, X, AQ
IV: 5 or more mounds (informally arranged; all less than 2 m high)	0	-	0	-
V: 5 or more mounds (at least 2 arranged orthogonally; all less than 2 m high)	3	Q, U, W	1	U
VI: 1 or more mounds (at least 1 being 2 – 5 m high)	2	R, S	1	S
VII: 1 or more mounds (at least 1 being higher than 5 m)	0	-	0	-
TOTAL	39		8	

Table 1. Settlement units in the Minanha Site Core sampling universe, divided by types (adapted from Iannone 2006b:2).

groups diachronically, from their initial occupations to their abandonment, is useful as an approach for understanding the relationship between the social histories of individual households, and the broader catalysts of social and political change within the Minanha settlement. Moreover, it allows for an evaluation of community dynamics throughout time, in particular the differential response this community had to the “rise” and “fall” of Minanha’s royal court (Iannone 2005, 2006a).

Humble Beginnings - The Early Classic Community

The earliest evidence for occupation at Minanha stems from a chultun burial, B112-B/1 (OP112), located in Minanha’s Group M, located next to a naturally occurring spring, in an area that would later become adjacent to the site’s royal residential acropolis. This burial dates to the Late – Terminal Preclassic (400 BC – 250 AD; conventional date [B.P.]: 1750 +/- 50; 2 Sigma cal: 60 BC – AD 80). However, tamped earth floors found in association

Type	Group	Excavated Structures	Total
I: isolated mound (less than 2 m high)	134, 137	134, 137	2
II: 2-4 mounds (informally arranged; all less than 2 m high)	AC	126AC, 127AC	2
III: 2-4 mounds (orthogonally arranged; all less than 2 m high)	V, X, AQ	103V, 104V, 105V; 109X, 110X; 101AQ, 172AQ, 173AQ	8
IV: 5 or more mounds (informally arranged; all less than 2 m high)	none	none	0
V: 5 or more mounds (at least 2 arranged orthogonally; all less than 2 m high)	U	96U, 97U, 98U, 99U	4
VI: 1 or more mounds (at least 1 being 2–5 m high)	*S	72S, 73S, 74S, 75S, 76S, 78S, 79S, 80S, 81S, 82S, 83S, 177S, 77S	13
VII: 1 or more mounds (at least 1 being higher than 5 m)	none	0	0
TOTAL	8	29	

Table 2. Minanha Site Core settlement excavations, showing groups and individual structures (Longstaffe 2010:52).

with a range structure (Structure 12A; Seibert 2006:111), Minanha's ballcourt (Structures 2A and 3A; Schwake 2008:129), and Plaza A in the site epicenter, are likely to be equally early (G. Iannone, personal communication, 2010). The presence of Terminal Preclassic ceramic materials recovered from later mixed-fill deposits within the Site Core settlement bolsters this notion that people were living at Minanha during this period. Although there was clearly some settlement expansion during the Terminal Preclassic, in areas that would later become Minanha's epicenter, major population growth throughout the greater Minanha settlement did not occur until the Early Classic. It is at this time that households were established, and population

growth occurred throughout Minanha's Site Core (Table 3).

The Early Classic Site Core community at Minanha was multifaceted, yet its members lived a shared material existence, structuring their daily lives around meeting their subsistence needs. This early settlement was small, consisting of scattered households in what would later become the site epicenter, and on its surrounding natural terraces (Iannone et al. 2006; Longstaffe 2010; Longstaffe et al. 2010). Minanha is located in foothills of the Maya Mountains, on the Vaca Plateau, in a natural landscape characterized by steep hills, protruding bedrock and poor soils, and an overall lack of water. The earliest households of this "deep rural" settlement exploited the best

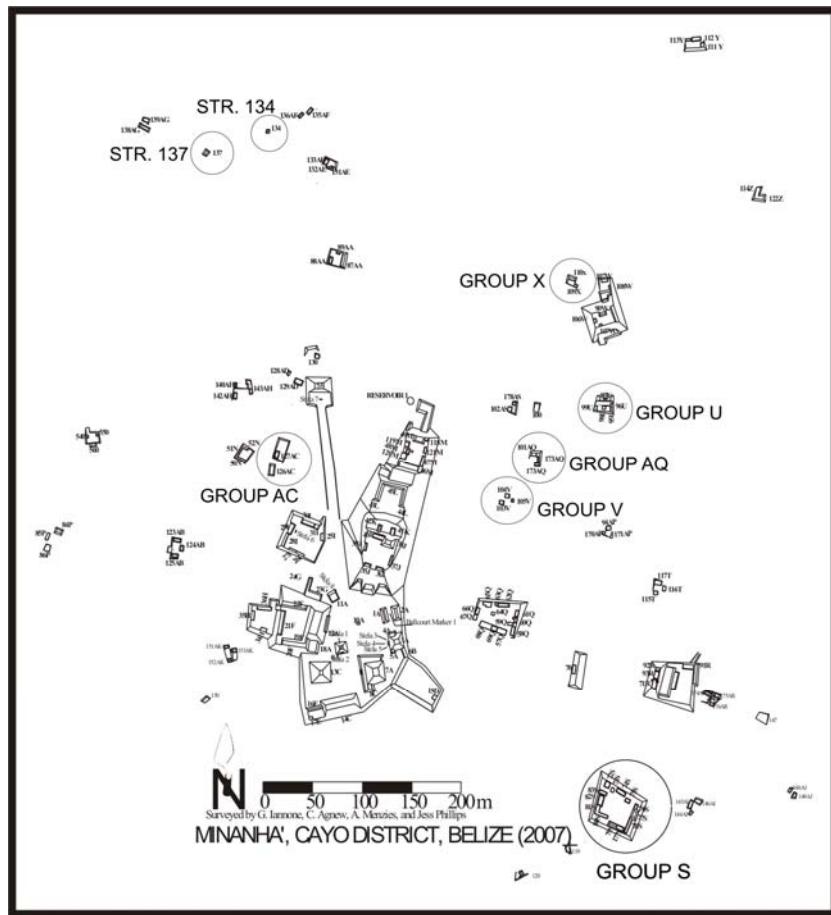


Figure 3. Rectified isometric map of Minanha's Site Core, showing location of house-group excavations (Longstaffe 2010:71).

land in this area, establishing themselves in the most resource rich areas of the Site Core (Iannone et al 2006; Iannone et al 2007; Longstaffe 2010). Importantly, these earliest settlers, aware of the lack of surface or running water in the area, established themselves adjacent to, or nearby natural springs (Iannone et al. 2006; Longstaffe 2010; Longstaffe et al. 2010).

The daily rhythms of these households bonded this early community together through collective and shared experience – these families sharing a common material existence, and practice and ideals in both construction technique and ritual practice (Iannone et al. 2006, Iannone et al. 2007; Longstaffe 2010). Those buildings associated with the Early Classic Site Core community were constructed using a consistent building practice, where small

dry-stone fill was overlain with a characteristically buff, or pinkish-orange, compact aggregate core, and then plastered, to form a thick, hard floor surface (Iannone et al. 2006; Longstaffe 2010). In most cases, the masonry frontings of the platforms of these early buildings featured well-made, soft limestone cut-stones. While these early Minanha settlers invested labour, time, and materials into forming a physical foundation for their community, many of these families firmly anchored themselves by establishing a connection to the landscape through ancestor veneration practices of varying complexity and scale (McAnany 1995, 2010; Longstaffe 2010).

At Group AQ, two individuals – one adult and one juvenile – were interred in association with the erection of the founding

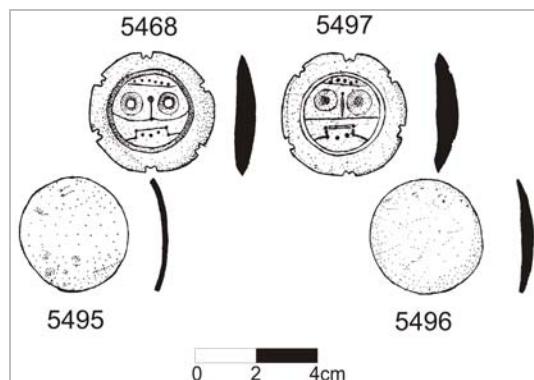


Figure 4. Shell adornos recovered from Structure 99U, 99U-B/1 (source: Social Archaeology Research Program).

buildings of this group (Longstaffe 2010). The adult interment was placed in a simple crypt cut into the bedrock at a central locus between two structures in the group, possibly serving as both a physical and symbolic foundation for which the group was founded. Accompanying this burial was two Chan Pond Unslipped: Chan Pond Variety ceramic vessels, the smaller of which may have served as a lid for the larger (Mosher and Seibert 2006). Although no grave goods accompanied the juvenile individual, a small capstone was placed over its head. At nearby Group U, two burials were placed into courtyard extensions on the eastern and western edges of this patio respectively. The earlier of the two individuals (99U-B/1), interred on the western edge of the courtyard, was accompanied by four conch shell discs, laid dorsally over the individual in an east – west arc, two of which featured anthropomorphic faces (Longstaffe 2010). The northern-most and southern-most discs, in contrast, resembled “poker chips” in shape, size, and colour. Although these latter discs were well-shaped and polished, they lacked decoration (Figure 4; Stanchly, personal communication 2010).

Elsewhere in the Site Core, at Group S, what would later become the largest, and most important household of the Site Core community, burials were interred into what was likely a formal eastern ancestor shrine (Iannone et al. 2007). At Group M in the site epicenter, burials were placed into a

chultun, and its opening covered with large slate capstones (Gonzalez and Iannone 2005; Turuk et al. 2005). The location of this latter residential group is significant, as it is situated not only near the top of the highest hill in the region, but also at the site of one of Minanha’s few natural reservoirs.

Regardless of the varying complexity of household veneration rituals, the ties established to the landscape through their practice would later become fundamental to the historical and social trajectories of these Site Core households. Throughout the Middle and into the Late Classic, the social diversity of Minanha and the Site Core community mounted – culminating in the establishment of a royal court at some point during the early 8th century (Dell 2009; Iannone 2005). At this time, the social dynamic of the Site Core community undoubtedly shifted to reflect the political complexity of this new Minanha city-state, and its regal-ritual institutions.

The “Rise” of the Royal Court - The Late Classic Community

The rise of Minanha’s royal court unquestionably affected the daily lives of those families who had lived previously in the Site Core during the Early Classic. In adapting to the new political dynamic of Minanha, many of these families renegotiated their daily pursuits to meet not only their basic subsistence needs, but also new tax demands (Longstaffe 2010; Longstaffe et al. 2010; see also Trigger 2003:394, 662-664). At this time, the population of Minanha was burgeoning, and construction was a common event. In the epicenter, Group M was incorporated into the royal acropolis as a residential compound. On the surrounding natural terraces, existing families expanded and modified their houses, and new households were also established (Table 3). At Group S, interestingly, although occupation continued, construction was minimal (Iannone et al. 2007).

As a whole, the amount of labour invested in the construction of the Site Core’s Late Classic buildings was less, and

		Settlement Unit							
Date	Chronological Period	Group AC	Group AQ	Group U	Group V	Group X	134	137	
1200									
1100	Early Postclassic								
1000									
900									
810	Terminal Classic								
750									
700	Late Classic	126AC 127AC	101AQ-1st	98U	104V				
675	AD			96U 97U 99U	103V 105V-1st 105V-2nd				
600	Middle Classic					134	137		
550									
500									
450									
400									
300	Early Classic		101AQ-2nd 172AQ-2nd 173AQ-2nd 172AQ-B/1 173AQ-B/1	96U-B/1					
350									
300									
250				99U-B/1					
200									
150	Terminal Preclassic								
100									
0	BC								
100									
200	Late Preclassic								
300									
400									

Table 3. Chronology of Minanha's Site Core Settlement (Longstaffe 2010:167).

materials used for their construction was qualitatively inferior when compared to those houses built during the Early Classic (Iannone et al. 2007; Longstaffe 2009, 2010; Mosher and Seibert 2006; Seibert 2007). Many of the Late Classic building projects, both residential and regal-ritual, were characterized by large dry-stone fill with limited aggregate core, and platform facings made of boulders and roughly shaped soft limestone cut-stones (Iannone et al. 2006). Although this decline in house quality may reflect decreased social value in household construction, given the use of lower quality building materials and a decreased investment in labour, the demands of the royal court likely detracted from the time and/or resources necessary to engage in the more involved building practices characteristic of the earlier community

(Iannone et al. 2007). In other words, it appears as though members of the Late Classic Site Core community were focusing labour and surplus away from the construction and maintenance of their own houses, towards other pursuits, and meeting tax demands (Longstaffe 2010).

The royal court complex itself would have required significant labour for its construction and maintenance, and the members of Site Core community were an indispensable economic resource for Minanha's regal authority. Prior to the rise of the royal court, the household economies of Minanha's Site Core community members were largely self-serving. During the Late Classic, in contrast, those families with established linkages to the landscape through ancestor veneration practices likely held land tenure, and were able to diversify

their household economies while continuing subsistence agriculture. These households engaged in new and innovative integrative economic, social, and political strategies to meet their newfound tax demands, and to ensure a continued existence (Longstaffe 2010). In contrast, the many settlers that came to Minanha in the Late Classic, who lacked sufficient land and the means to engage in subsistence agriculture, likely entered into more intensive, and possibly more specialized non-domestic economic pursuits. In addition to many other activities, these “landless” newcomers to the community were engaged in diverse economic roles such as masons, potters, tool makers, mat makers, soldiers, weavers, traders, and/or hunters (Longstaffe 2010; see also Marcus 2004:265; Trigger 2003:156). In short, the spatial proximity of the Late Classic households to the royal court complex suggests these families were actively engaged in support roles for this authority, providing corvée labour, household surplus, and other services to aid in the maintenance of the royal court (Iannone et al. 2006; Iannone et al. 2007; Longstaffe 2010; Hirth 2009; Trigger 2003:394).

The large and wide ranging material assemblage of Minanha’s Group V household suggests that its inhabitants were engaged in what Kenneth Hirth (2009:21-22) defines as “multicrafting” (Longstaffe 2010:180-184). Multicrafting is “the practice of engaging in multiple crafts within the same household” (Hirth 2009:21). Hirth (2009:21-22) suggests that these efforts “often represented an increase in the commitment to crafting as a component of the domestic economy”. The large and variable artifact assemblage of this household is interesting, as it suggests that its members were producing both prestige and utilitarian goods for intra-community exchange (Aldenderfer 1990; Aoyoma 2007; Cotsin 2001). This assemblage included a large quantity of various raw materials, most commonly slate and granite, both finished and unfinished tools, and also tool preforms. In addition to these utilitarian objects, a

groundstone mirror, several hematite mosaic pieces, and number of failed and broken objects of imported marine shell were also recovered from this household (Mosher and Seibert 2006; Longstaffe 2010:181-184). Although the archaeological evidence suggests that members of the Group V household appear to have had a more intensive crafting focus, this is not to suggest that crafting was not occurring at other households; rather that crafting was this household’s primary economic pursuit. Other households, particularly those larger, previously established families with land tenure, had inelastic labour demands, access to arable land, and were able to engage in multiple, less specialized economic tasks (Hirth 2009:15; Longstaffe 2010).

Group AC, located adjacent to the *sacbe*, appears to have served as a non-elite political support unit for Minanha’s royal court (Longstaffe 2010:184-189). This group featured a large and accessible public courtyard, and a primary bi-level building with an inset stair and a sizable “C-shaped” bench, facing the *sacbe*. This building’s size and layout, suggests that it was designed to accommodate many individuals. The paucity of raw materials and other specialized tools associated with this household suggest crafting efforts or other domestic economic pursuits were limited. The presence of cooking refuse, albeit in limited numbers, indicate that to some degree, cooking took place at this group. These materials included two metate fragments recovered in situ on the front landing of the bi-level building, obsidian blades, several sherds from thick-walled cooking jars, and an unslipped spout from a jar. Interestingly, however, dominating the ceramic assemblage of this group was an elevated frequency of ashware serving vessels (Longstaffe 2010:187-188). The frequency of these types of vessels, in comparison to other settlement units in the Site Core, suggests the serving of food was likely a frequent event at this household (Hayden 2001:40-41). The paucity of feasting refuse, however, may reflect both the public function of this household, which

would have been regularly swept clean, and also the excavation strategy, which did not explore the interstitial areas between the group's two structures, or areas off its patio (Brown 2001). Communal events such as feasting were important, particularly in a Late Classic community dynamic, as a means to ease tensions between socially discriminate households, while at the same time reinforcing and reifying the roles, obligations, and social differences between subservient commoner household and the royal court (Gillespie 2000; Hayden 2001; Joyce 2000).

After Collapse - The Late/Terminal Classic Transition

While some community members may have viewed the royal court as a burden to their existence, others may have considered it a blessing. Regardless of any short-term gains made by community members during the reign of the royal court, one thing is clear with the onset of – the Terminal Classic, the social and political dynamic of Minanha shifted dramatically (Iannone 2005; Iannone 2006a; Iannone et al. 2006; Iannone et al. 2007; Longstaffe 2010; Longstaffe et al. 2010). In the site epicenter, monuments and stucco facades were destroyed, construction projects were halted in mid-progress, and the royal residential courtyard, the physical and symbolic seat of power at Minanha, was buried (Iannone 2005). Although the Late-Terminal Classic transition was marked by overall population decline, after the fall of Minanha's kings, many members of the Site Core community continued to live, build, and in some cases, thrive. The landless households of the Late Classic Site Core community struggled, as they could no longer meet basic subsistence needs and in many cases, abandoned their homes (Longstaffe 2010).

In contrast, those community members who had earlier established ties to the land, in both the epicenter, Site Core, and elsewhere in the surrounding the settlement zone, continued to live at Minanha (Iannone et al. 2006; Iannone et al. 2007; Longstaffe 2010; McCane et al. 2009). The established

linkages of these households to the landscape likely provided them with privileged access to resources, and resulted in elevated political authority within the community following the collapse (Longstaffe 2010; McAnany 1995, 2010). Although the benefits of "first occupancy" during the Late Classic were nuanced at best, during the Terminal Classic they became significantly more pronounced. It was during this period that the residents of Group U constructed a household shrine. Although not a formal eastern ancestor shrine, this building, situated in the middle of the Group U courtyard, was constructed using high quality materials, reflecting not only the social value of this structure to the group's inhabitants, but also their ability to invest labour and materials in its construction.

At Group AQ, prior to the erection of 173AQ-1st, residents cut into the floor of the penultimate building, and the remains of at least two individuals were placed in its fill (173AQ-B/2; A. Snetsinger, personal communication, 2010). During excavation, only the remains of one individual were discernable, placed flexed with their right side down. Although the remains of these two individuals were fragmentary, one or both of these individuals featured hematite inlaid, and carved teeth, which may have indicated elevated, or special status within the household, or community at large (Becker 1973:401; Sharer 1978:57). However, the fact that these burials were devoid of a distinguishable grave feature, capstones, lacked grave goods, and were simply incorporated into the construction fill contradicts this notion (Haviland and Moholy-Nagy 1992:53; Mosher and Seibert 2006).

Elsewhere, Group S, which was stagnant in terms of development during the reign of Minanha's royal court, saw a punctuated spike in construction, to become the largest non-elite residential unit of the Site Core settlement (Iannone et al. 2007). This household erected several new buildings, modified others, and focused considerable efforts in the remodeling of its eastern shrine

to include a multiple re-entry tomb (Iannone et al. 2007; Schwake 2002). This tomb contained re-interned earlier burials, as well as several new ones – some with sumptuous grave goods, including shell pigment containers, and an ink pot with a modeled face on the front, and a repetitive *ahaw* glyph on its sides, a number of items of personal adornment made of shell, jadeite, and hematite, and a Zacatel Cream Polychrome vase (Iannone et al. 2007; Schwake 2002, 2008). Associated with the modification of this shrine was a multiple internment situated in front of its basal platform. This consisted of several commingled individuals with minimal grave goods (Schwake 2008).

In short, after the fall of Minanha's royal court, it appears as though the original powerbrokers of the Site Core Community reasserted their authority, and engaged the political, social, and economic opportunities presented by this new post- royal court community dynamic (Longstaffe 2010; Longstaffe et al. 2010). For the most part, the Late Classic to Terminal Classic transition at Minanha appears to involve what Iannone (Longstaffe 2010: 222; Longstaffe et al. 2010) has called a "compression" of Maya society. Specifically, the archaeological evidence suggests that the social antipodes – the elite, particularly the rulers and key members of the royal court – abandoned the city-state first, along with "landless" commoners. The absence of these social groups left a number of larger, and prosperous heterogeneous households that had long-standing control over improved land and perennial water sources. In the case of these households, their social trajectory and abandonment strategies reflect their longevity and resilience, social positioning within the community, ties to agricultural land and other resources, and access to reliable water sources (Longstaffe 2010). Similar processes of societal "compression," or differential abandonment, have also been documented at Dos Pilas by Joel Palka (2003:126-132), and Ashmore (2004:321-322) and colleagues at Xunantunich.

Although little is known of the undertakings this community, its vitality is inferred through the labour required for the infilling event of the royal residential courtyard, and the fact that construction, veneration practices, and occupation continued, in some cases, into the Early Postclassic (Iannone et al. 2007; Longstaffe 2010). The households of this terminal community were apparently the most resilient components of the greater Minanha society – although they too appear to have met their demise in the ensuing centuries.

Conclusion

In framing the response this commoner community had to both the "rise" and "fall" of Minanha's royal court, it is clear that the reaction individual households had to the events of the 8th century collapse was differential. The divergent strategies of these households and their members reflect the historical and social contingencies of these families, in many cases, extending centuries prior to the "rise", and also after the "fall", of Minanha's royal court. The social trajectory of Minanha's households reflects their degree of adaptability, resilience, and historical contingencies, and is related to their long-term social, political, and economic roles and relationships with the broader Minanha community.

Although household and settlement archaeology studies have increasingly led scholars to be cognizant of the reaction commoner populations had to the events that led up to, and followed the Classic Maya "collapse", it is only recently that the actions of these populations have been considered as part of an integrative, dynamic, and adaptive communities. Moreover, it is becoming increasingly evident that the response communities had to the Maya "collapse" were mediated by multi-scalar long-term socially and historically contingent circumstances, and these need to be examined on a case-by-case basis. In many cases, the social trajectories of Minanha's households were mediated by, and reflect their ability to adapt and respond to, political

and social changes within the community at large.

On a final note, the conclusions drawn from the study of Minanha's Site Core households articulates well with a growing body of knowledge that distances itself from deterministic, mono-causal explanations of the collapse (e.g., Culbert 1973; A. Chase and D. Chase 1989; Demarest 1997a, 1997b; Diamond 2005; Gill 2000; Gill et al. 2007; Hodell et al. 1995; Sabloff and Willey 1967; Thompson 1954; Webster 2002; Webster et al. 2004; Yoffee and Cowgill 1988), and suggests, rather, that the Classic Maya "collapse" is better represented as a broader political transformation (Aimers 2007; Demarest et al. 2004; Iannone 2005; Iannone et al. 2007; McAnany and Yoffee 2009). In the case of Minanha's Site Core community, those many families that established both a physical and symbolic connection to the landscape in the Early Classic weathered the tumultuous events of the 8th Century. Although these families abandoned the site in the following centuries, their continued existence at Minanha after the "fall" of the royal court demonstrates their resilience, robustness, and ability to adapt to a changing social and political environment (Longstaffe 2010).

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5 **AIRBORNE LiDAR AT CARACOL, BELIZE AND THE INTERPRETATION OF ANCIENT MAYA SOCIETY AND LANDSCAPES**

Diane Z. Chase, Arlen F. Chase, Jaime J. Awe, John H. Walker, and John F. Weishampel

The application of airborne LiDAR to the archaeology of Maya landscapes promises to change our perception of their civilization. Our current view of ancient Maya society has been conditioned by past investigations that, of necessity, have been limited in scope. Even with remote sensing, archaeological survey has been curtailed by karst topography and dense tree canopy – and archaeological excavation often constitutes only a small sample of what was actually present. Similarly, epigraphic analysis of texts are restricted; interpretations of the full range of Maya society are unlikely to be achieved through study of epigraphic texts alone as these records are generally focused on the one segment of society – the elite. With the recent application of LiDAR (light detection and ranging) technology to penetrate the heavily forested canopy of Caracol, Belize, landscape archaeology has succeeded in illuminating the complexity and expansive nature of ancient Maya cities.

Introduction

While the ancient Maya of the Classic Period were in contact and interacted with each other, they did not constitute a uniform cultural expression. Although there was trade, visitation, and warfare among ancient Maya political units, a single social or political model cannot be used to characterize them. This is evident in the diverse archaeological forms that their settlements took relative to their landscapes. The size of ancient Maya sites and polities varied and, because of this, concomitant organizational requirements also differed. This paper focuses on one segment of the Classic Period spectrum of socio-political forms, looking at the large and populous site of Caracol, Belize. These reconstructions concerning the socio-political organization of this city are informed by analysis of hieroglyphic texts, settlement survey, excavations, and remote sensing. Each data source contributes significantly to overall interpretations. Together, these materials permit a broader and more in-depth understanding of the complexity involved in ancient landscape modification and in the organizational requirements necessary to support a Maya urban expression.

The Archaeological and Hieroglyphic History of Caracol

Caracol is located at an elevation of 500 meters in the Vaca Plateau of Belize.

Situated in the karst foothills of the Maya Mountains this area receives over 2000 millimeters of rain per year. The site extends over approximately 177 square kilometers. However, settlement survey has been hindered by covering sub-tropical forest with a canopy height of approximately 25 meters. This contrast with what the landscape must have looked like in antiquity, when construction and agricultural terraces replaced the forest growth.

Settlement and landscape archaeology have been grounded in survey and excavation, but sample size has been limited by vegetation that hides archaeological remains, requiring labor-intensive on-the-ground survey. Thus, any determination of settlement boundaries and/or the totality of landscape modifications have usually been presented as hypothesis and speculation. Because of the inherent difficulties in defining the full parameters of ancient settlement, the focus for most socio-political interpretation traditionally has reverted to the concentrations of monumental architecture that are found in the centers of most Maya sites. This monumental architecture produces tombs and specific building forms and plans that can be used for general comparative purposes. Importantly these same remains also usually occur in conjunction with hieroglyphic stone monuments. Because the archaeological record is so difficult to directly “read,” the

hieroglyphic records have become pivotal in our current understanding of ancient Maya political interaction (e.g., Martin and Grube 2000). But, the epigraphic record is realistically as incomplete as the archaeological surveys. The hieroglyphics represent only a small segment of ancient Maya society and only describe a very restricted range of topics. How much direct insight they provide for the interpretation of the full range of ancient Maya social and political organization is an open question.

Even though incomplete, the hieroglyphic record provides an excellent frame from which to build a discussion of socio-political regions. For Caracol, the site's texts record the potential founding of its dynasty in A.D. 331 and the existence of an epigraphic history that includes minimally 28 rulers and ends in A.D. 859 in the GMT correlation. The texts document warfare and important events in the lives of several of Caracol's rulers. The war events recorded in the epigraphy also have been key in examining polity size, as they represent conflict between different societies in the Maya lowlands. These texts show that star-wars generally occurred between two sites that are separated by a distance of 66.25 kilometers (A. Chase and D. Chase 1998a:23). Intriguingly, the distance that a marching army can effectively control matches this measurement, being approximately 60 kilometers or a two-day march. However, this does not necessarily mean that contiguous bounded territories always existed; in fact, the attempt to define Maya polities by their territorial boundaries probably reflects a Western perspective regarding political control and land ownership. Based on other Mesoamerican patterns, territorial boundaries themselves were probably not the primary concern of the Maya; instead, control focused on resources and on political and economic factors, meaning that polities may have extended into distant areas.

Archaeological research has been able to establish that there are a series of "foundings" at Caracol in addition to the "dynastic founding" indicated in the

hieroglyphic record (A. Chase and D. Chase 2006a). The initial settlement of the Vaca Plateau is estimated to have taken place by 600 B.C., almost 1000 years prior to the official dynastic founding of Caracol in A.D. 331. In addition, an "ideological founding" of Caracol occurred in the early years of the first century A.D. Two of the major buildings in the A Group (Structures A2 and A6) were established at the beginning of the 8th Cycle in A.D. 40 (A. Chase and D. Chase 2006b), suggesting the existence of a powerful elite at Caracol some 300 years before their appearance in the hieroglyphic record. At this same time, several distinct centers – Caracol proper, Cahal Pichik, and Hatzcap Ceel – emerged in the Vaca Plateau. The central plans of all of these centers were characterized by the appearance of what are called "E Groups" (A. Chase and D. Chase 1995) and all three centers were eventually linked together by causeways and settlement into a single metropolitan system. While the early landscape in the Vaca Plateau may have been characterized by minor polities and competing political units, the later landscape demonstrates that these centers were conjoined into a single capital city. The settlement distribution clearly reveals that the Caracol epicenter became the most important locale over time. It may be that Caracol's epigraphic name, the "three stone place," literally refers to the consolidation of these three centers into a single place by A.D. 331. A third "administrative founding" is associated with the huge population growth that occurred at Caracol in the early Late Classic Period; this founding is physically represented on the ground by Caana, an architectural complex that is unique in the site's landscape (A. Chase et al. 2011).

The majority of the hieroglyphic monuments from the Caracol epicenter date from between A.D. 530 and A.D. 680. During these years, the site appears to have carried out several episodes of successful warfare in the Peten of Guatemala – specifically against Tikal and Naranjo – and the population at Caracol appears to have

burgeoned to at least 100,000 people. Although there are few hieroglyphic texts from between A.D. 680 and A.D. 790 at Caracol, it is clear from the archaeological record that this was still a time of prosperity and growth (D. Chase and A. Chase 2003) – in spite of the lack of dynastic history. The monumental record reappears at Caracol after A.D. 790 and there is some suggestion that the eventual “collapse” at this site may be related to political mis-steps correlated with the attempted resurgence of dynasty at this time (A. Chase and D. Chase 2007).

LiDAR (Light Detection and Ranging)

For almost 30 years, the Caracol Archaeological Project (www.caracol.org) has been involved in recording the settlement at Caracol. This has been difficult because of the karst environment and the encompassing jungle. Nevertheless, we have been able to document the size of the site and to indicate how a system of dispersed reservoirs and extensive agricultural terracing was integrated with the residential settlement and was capable of supporting the site’s population (A. Chase and D. Chase 1998b). Besides excavating and testing most of Caracol’s epicenter, over 120 residential groups also have been investigated. Although we have successfully mapped some 23 square kilometers of Caracol’s residential groups and causeway termini, traditional survey proved inadequate for documenting and/or modeling such a large settlement area. Through the end of the 2009 field season, we had neither been able to define the limits of the site nor completely demonstrate the intensity of agricultural terracing – fully mapping agricultural terraces only in a sample of approximately 4 square kilometers. Thus, in spite of an extremely large dataset, it was difficult to fully contextualize the archaeological data from the site.

In order to resolve these issues, we began searching for alternative ways to determine the settlement area of Caracol through the use of remote sensing. These early attempts were largely unsuccessful.

However, LiDAR had been used to great advantage in Costa Rica to make interpretations about tree canopies (Drake et al. 2002; Weishampel et al. 2000). Early archaeological use of single-phase LiDAR, however, had not been successful (Sheets and Sever 1988) and this form of remote sensing had not been pursued in tropical or sub-tropical archaeology. However, we were encouraged to find a LiDAR image of Copan that was first published in 2001 (Gutierrez et al. 2001); this image suggested the ability of this technology to accurately record ground remains – although the remains at Copan, unlike those at Caracol, were in largely cleared areas. Thus, a group of us became convinced that LiDAR had the potential to work in revealing ground-level features constructed by the ancient Maya. However, it took several years to secure funding to try this technology to search below the Belize jungle canopy. In 2008 funding was secured from NASA (Grant NNX08AM11G to Weishampel, A. Chase, and D. Chase) that permitted us to test LiDAR against the mapped archaeological remains of Caracol – and, in April 2009, the National Center for Airborne Laser Mapping made a swath-based LiDAR survey for us of 200 square kilometers centered on the Caracol epicenter (A. Chase et al. 2010, 2011; Weishampel et al. 2010).

LiDAR is a remote sensing technology that employs lasers to obtain point data that can then be used to create detailed imagery. In the case of Caracol, ground GPS units were established at various locations for satellite triangulation with the laser points. A plane outfitted with the necessary instrumentation was flown at a height of 800 m above Caracol in a series of parallel paths that produced overlapping fields. The system mounted on the bottom of the plane pulsed lasers down to the ground and returned a series of points that produced records of both the ground elevation and the canopy structure. Some 4.28 billion measurements were obtained in this manner with a ground return of up to 20 points per square meter. Using the last laser returns, which presumably represented the ground

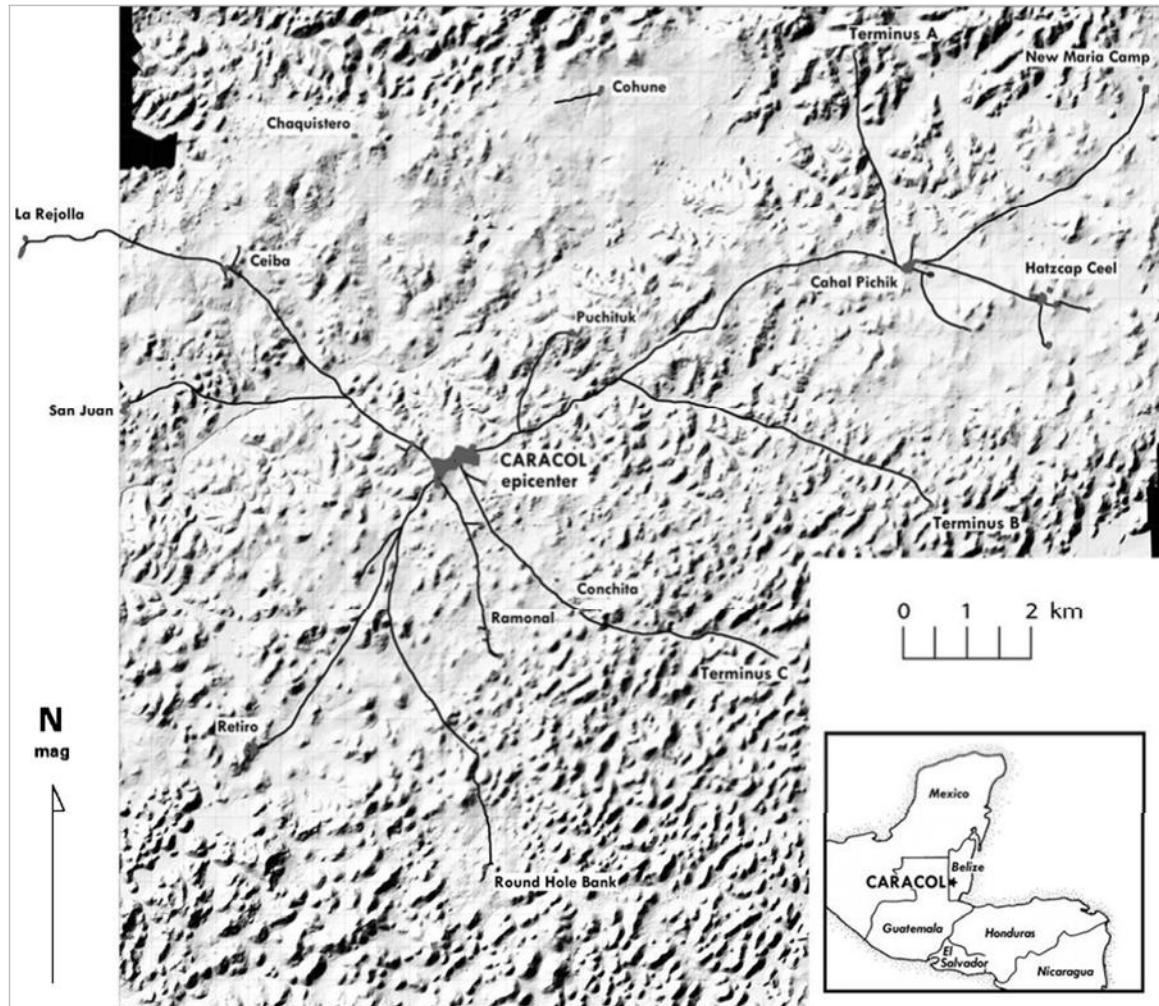


Figure 1. The Caracol LiDAR DEM with an overlay showing the site's causeway system and connected architectural nodes; the DEM covers 199.7 square kilometers.

level, a Digital Elevation Model of 199.7 square kilometers of the Caracol landscape was produced (Figure 1). Within this DEM, it is possible to identify causeways, terraces, residential groups, and individual structures, including those elevated no more than 5-30 centimeters above their surrounding ground surface. The DEM located 11 new causeways, 5 new termini, and thousands of new structures and terraces. It will take some time to make a full analysis of the overall landscape, but minimally 4,732 elevated platforms supporting residential groups are evident in the DEM (A. Chase et al. 2011). More detailed work will likely double this count when ground-level residential groups in flat areas and among

the terraces are included. However, even limited analysis of the DEM permits a much fuller definition of Caracol's settlement density, integration, and limits.

It is clear from the Caracol LiDAR DEM (Figure 1) that relatively dense settlement was present throughout most of the Vaca Plateau. Excavations that have been carried out in residential units within the area reveal that, while Early Classic occupation was more limited, almost all of these groups were occupied in the Late Classic Period. Concentrated nodes¹ of non-epicentral monumental architecture are embedded in this landscape; the majority of these nodes are linked to the Caracol epicenter by purposefully constructed

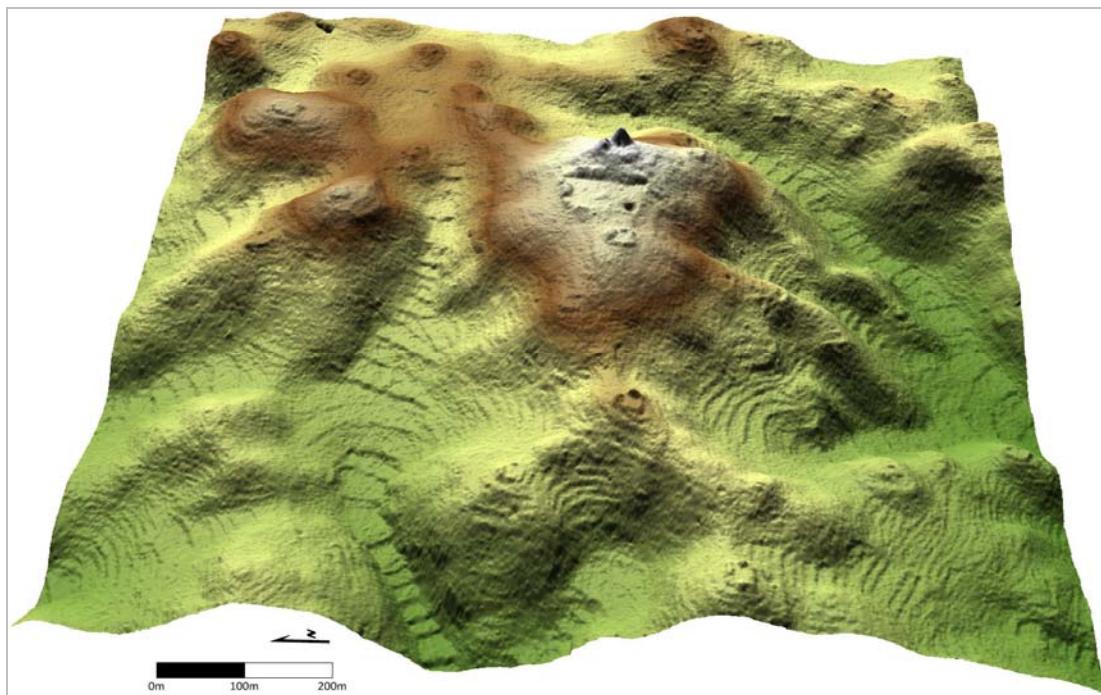


Figure 2. Image of the Puchituk area of Caracol rendered in 2.5D LiDAR, showing the causeway, the terminus, settlement groups, agricultural terracing, and topography.

causeways. While some of these nodes were constructed in the landscape as early as 300 B.C., archaeological data has shown that others were purposefully placed within the landscape in the early part of the Late Classic Period or A.D. 550 to 650 (Figure 2). Most of these nodes incorporate special-function plaza areas suitable for administrative and market functions. The causeways and the outlying monumental architecture and plazas were surrounded by residential settlement and agricultural terracing. The broader metropolitan area – composed of settlement, public architecture, road systems, and agricultural terracing – covered a sizeable spatial area that was integrated into a single city. In spite of the extent – already 200 square kilometers – it is important to keep in mind that the LiDAR DEM reflects metropolitan Caracol, but not the boundaries of the Caracol polity, which also ebbed and waned with time. Integrated within Caracol's direct political sway during the Late Classic Period were neighboring sites and regions, including the southeast Peten (A. Chase 2004) and occasionally the

Belize Valley (Helmke and Awe 2009), as well as other portions of the Vaca Plateau (Iannone 2005).

Parameters for Models of Maya Society

Roland Fletcher (2009) has defined a dispersed form of tropical settlement that he refers to as “agrarian-based low density urbanism;” this urban form is characterized by relatively dense – albeit dispersed – settlement over a relatively large spatial area. While there may be some variation within this tropical urban form, Caracol likely fits this kind of settlement characterization (A. Chase et al. 2010, 2011). In spite of the incorporation of agricultural production between housing within the city landscape, it should be noted that the site's population density was likely as great or greater than many modern suburban metropolitan landscapes. Even though broadly dispersed over the landscape, settlement at Caracol was still relatively dense (Figure 3), averaging approximately 600 people per square kilometer over 170 square kilometers (Tikal

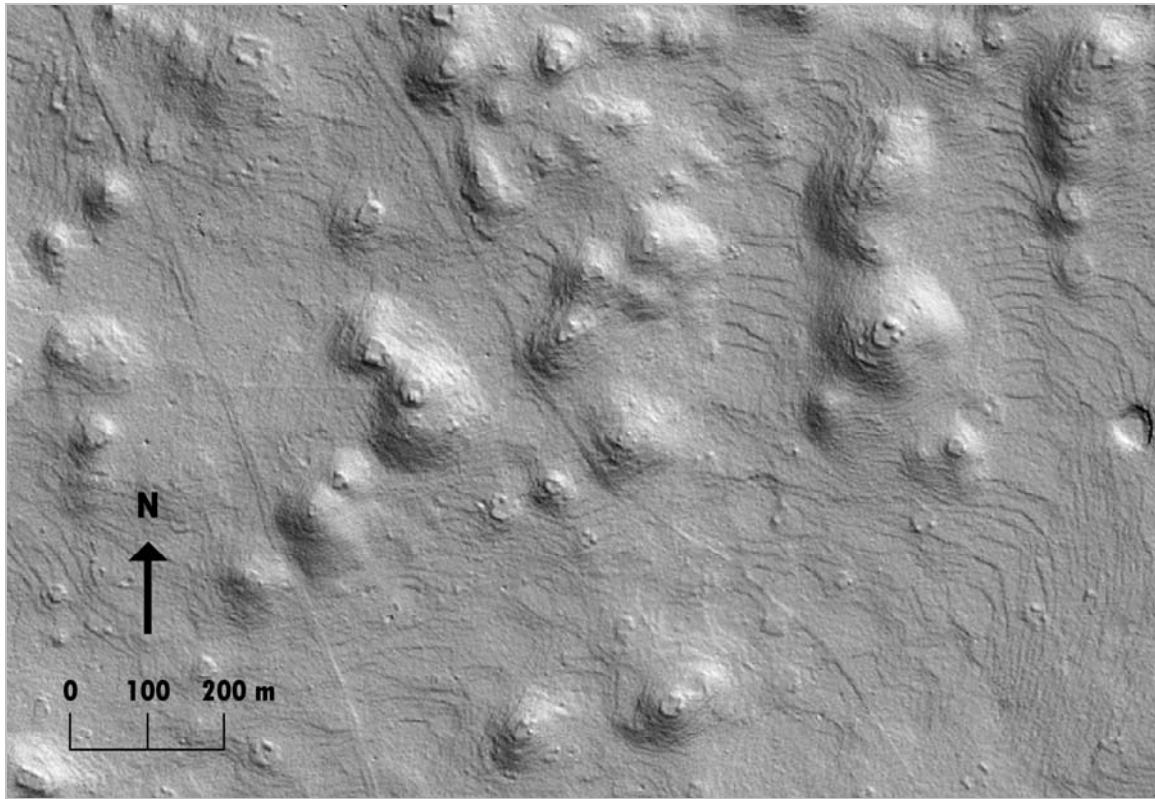


Figure 3. Image of south-central Caracol showing the dispersed residential settlement groups situated within almost continuous agricultural terracing, as well as parts of the Conchita and Pajaro-Ramonal Causeways.

averages 517 over 120 square kilometers; Culbert and Rice 1990). For a modern comparison, this contrasts with the 2000 U.S. census that indicates general population densities in Central Florida of between 381 and 458 people per square kilometer (as compared to an urban population density for Orlando of 768 people per square kilometer). Unlike more modern settlement patterns, the Caracol residential plazuela groups were embedded in and integrated with house-gardens and terraced agriculture (A. Chase and D. Chase 1998b). With an input of labor, these agricultural systems were capable of supporting this population density and were sustainable over the long term (Murtha 2009), constituting a Maya example of agricultural involution (Geertz 1963).

In spite of the multiple networked monumental architectural nodes in evidence in the Caracol landscape, as already noted, the hieroglyphic record is largely restricted

to the Caracol epicenter itself. When viewed from the broader perspective of the overall landscape, the largely central distribution of these texts is striking. However, some hieroglyphic texts occur outside of the central administrative unit; in the case of Caracol, they may correlate with the urban edges of the city. The occurrence of these texts at far-flung secondary administrative complexes within Caracol also correlates with potential times of stress, when it became necessary to reassert social or political boundaries. Thus, a series of texts occur at La Rejolla after the death of Kan II in A.D. 658; these monumental texts serve as a prelude to problems on the western border of the city that were brought to a head with Caracol's 160-day star-war with Naranjo in A.D. 680 (D. Chase and A. Chase 2003). Another late text, dating to ca. A.D. 835, comes from Hatzcap Ceel (Thompson 1931), suggesting that legitimization may have been necessary on

Caracol's eastern boundary during the Terminal Classic Period.

A similar spatial distribution of texts is evident at Tikal, Guatemala. Most of the hieroglyphic texts are concentrated in Tikal's epicenter (Jones and Satterthwaite 1982). However, an early 8th Cycle text occurs at Uolantun (8.18.13.5.11), representing either an independent polity that was incorporated into Tikal or, again, an early form of political control and legitimization. An outlying text from El Encanto matches the time of Tikal's conquest by Caracol (9.7.0.0.0; Jones and Satterthwaite 1982:109). Later texts at Jimbal (10.2.10.0.0 and 10.3.0.0.0) and at Ixlu (10.1.10.0.0 and 10.2.10.0.0) that use the Tikal emblem may similarly be viewed as attempts at confirming Tikal's networks during the Terminal Classic Period, clearly a time of stress in the central Peten. Thus, while we are comfortable in using the hieroglyphic texts to provide an outline of ancient Maya history, the simple distribution of these texts in terms of the archaeological landscape is just as informative politically, potentially reflecting not the appearance of new political units but rather the reaffirmation of existing, but contested, political relationships.

The size of Maya sites and polities clearly varied. Some centers, like Copan or Piedras Negras, were rather small with a concentrated outlying settlement that was largely **isolated** in terms of the larger landscape. Other Maya centers – like Calakmul, Caracol, Chichen Itza, Dzibilchaltun, and Tikal – were examples of extensive continuous settlements that formed about **primate** centers and constitute New World tropical forms of low-density urbanism. Yet, another political form consists of administrative nodes located at some distance from each other that were **linked** to form a single political system; this form is seen in the Northern lowlands at the linked site cluster of Uxmal-Nohpat-Sayil, in the series of sites associated with Ake, and in Coba's causeway links to Ixil and Yaxuna (Shaw 2006). In the Southern lowlands, Mirador may have once formed

the hub of such a Late Preclassic Period system, but it does not appear that this expansive polity survived into the Late Classic Period.

Thus, both polities and cities within the Maya lowlands were structured in various ways. Many, however, consisted of networks of administrative nodes rather than single central entities. In some cases, like Coba, these architectural nodes were located amidst settlement, but directly intertwined with each other and the site epicenter through a system of causeways that linked a broader landscape into a single urban system (A. Chase and D. Chase 2003). In other cases, like Tikal, while some of the monumental architectural nodes were linked to each other in isolation from the broader settlement, causeways were not used to integrate the landscape. At Caracol the entire causeway network had been engulfed, or perhaps even conditioned, by continuous settlement and formed the framework for a sizeable example of low density urbanism. While this expansive settlement concentration would probably be labeled by some researchers as a “city-state” or polity, given the LiDAR data that shows continuous settlement beyond surveyed areas, it is more probable that other networked administrative nodes existed at an even a greater distance from the central metropolis.

Discussion

We have estimated that over 100,000 people occupied Caracol in the Late Classic Period (A. Chase and D. Chase 1994; A. Chase et al. 2011). This is far beyond the lower range of 2,000 to 5,000 people (Houston et al. 2003:234) to the higher range of 5,500 to 9,500 people (Rice and Culbert 1990:Table 1.3) argued to have existed in certain smaller Maya centers - like Piedras Negras, Dos Pilas, and Copan – where arguments have been made that larger population numbers “would undermine and endanger systems of patrimonial, morally authoritative rule” and communal meetings (e.g., Houston et al. 2003:234). Thus, some researchers have argued that Maya cities – and, in some cases, polities (Mathews 1991)

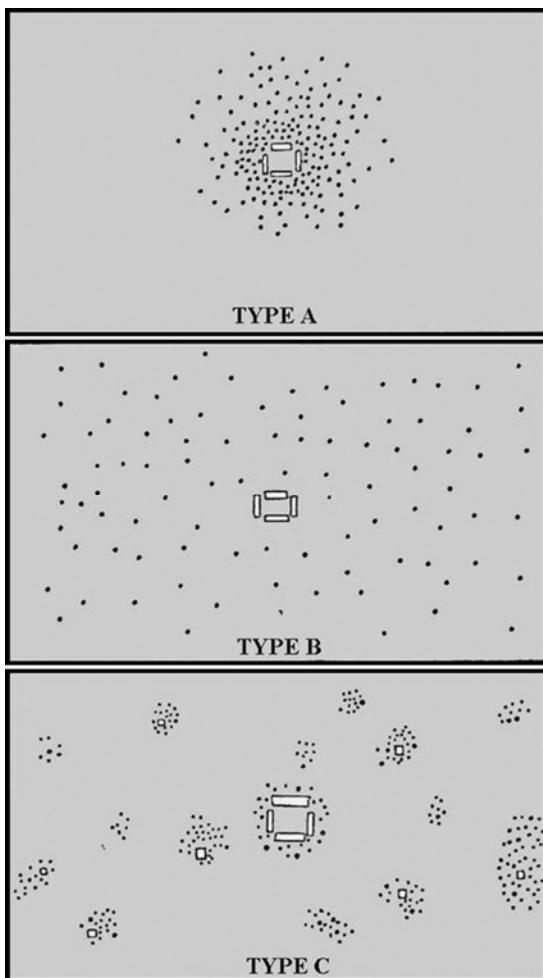


Figure 4. Gordon R. Willey's (1956) three potential models for the Maya landscape: Type A. settlement concentrated around monumental architecture; Type B. settlement dispersed and not associated with monumental architecture; and, Type C. one central area of monumental architecture and settlement with smaller monumental architecture and settlement dispersed over the landscape.

- are generally coterminous with royal courts (Houston et al. 2003:236; Webster 2001), implying that larger organizational structures were not characteristic of the Classic Period Maya. In this vein, sites like Caracol, Tikal, and Calakmul have been cast as anomalies; the implication is that they represent almost fringe “organizational arrangements” compared to the majority of Classic Period Maya centers (Houston et al. 2003:234). We would argue instead that these centers were not anomalous but rather represented examples of an organizational

structure that characterized the various larger polities found in the Maya lowlands.

Part of the issue for researchers dealing with the ancient socio-political structures of the Maya lowlands is our reliance on easily viewed data from site epicenters without a clear notion of the nature of the outlying settlement and landscape. Gordon Willey (1956) was the first individual to attempt to model Maya settlement in terms of the landscape. He conceived of three possible models (Figure 4): the first consisted of the site epicenter with residential settlement clustered around the central architecture (the European town model); the second was the site epicenter with residential settlement widely dispersed over the landscape (the vacant town model); and, the third was the site epicenter with some residential settlement and then smaller monumental architecture and associated residences dispersed over the landscape (a rural unstructured landscape). The linkages or networks that may have existed among the concentrated nodes of monumental architecture in this landscape were not addressed. Rather, the sites were viewed as largely autonomous and, because of the difficulty in undertaking large-scale settlement work in a tropical environment, considerations of relationships among sites were initially based on material culture and later on dynastic interactions.

This perspective of an unstructured universe still colors our archaeological interpretations. Even when epigraphers have suggested broader models of hegemonic integration, such as through political alliances with Calakmul or Tikal, our views of landscape have not been affected. However, the Caracol LiDAR DEM (Figure 1) explicitly shows how the ancient Maya universe was, in fact, structured and that at least in some cases, settlement areas may have been more dense, extensive, and interconnected than previously thought. Thanks to more than a quarter century of continuous research, it also is possible to gain some understanding of both how this structure evolved and operated over time.

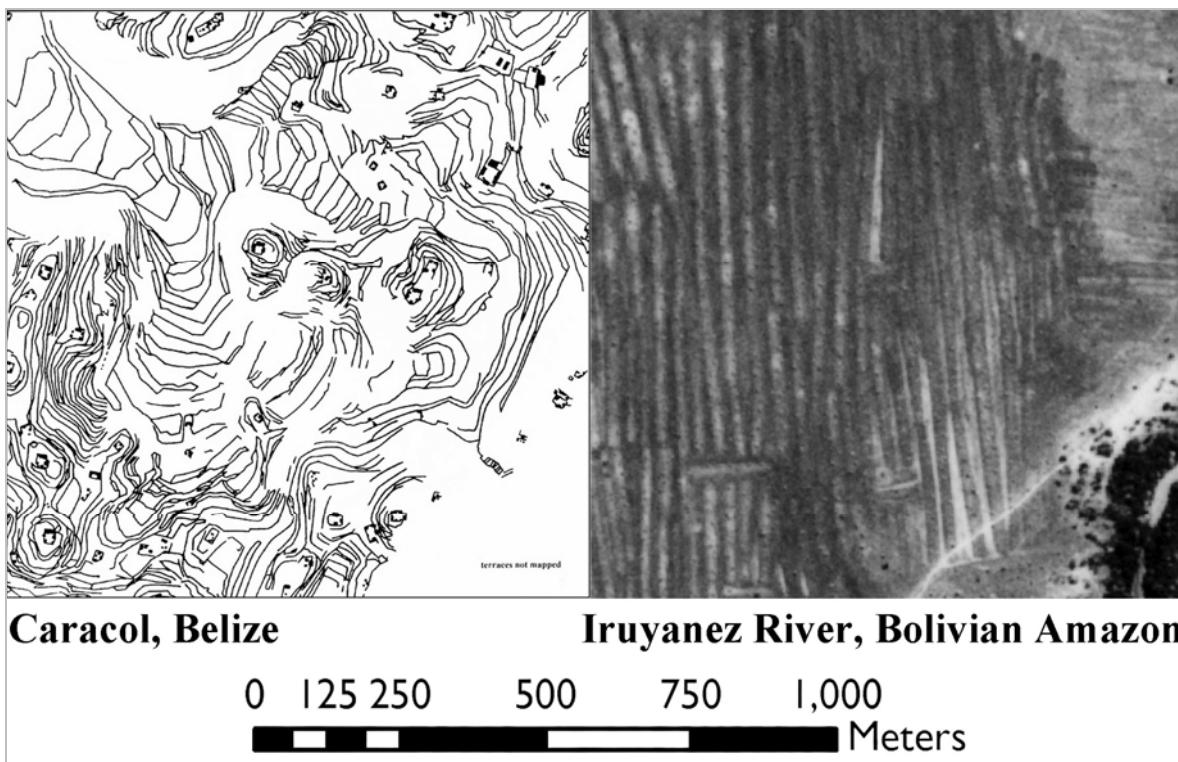


Figure 5. A comparison of Caracol's terraced landscape with its regularly interspersed residential groups (after A. Chase and D. Chase 1998: fig. 7) and a raised field landscape along the Iruyanez River in the Bolivian Amazon with settlement along the river levees; both landscapes represent one square kilometer.

The scale of the integrated Late Classic Period system at Caracol can be used to argue for an internal societal structure predicated on cooperation and not on conflict. We have previously described this cooperation as “shared identity” (D. Chase and A. Chase 2004a) and as “symbolic egalitarianism” (A. Chase and D. Chase 2009) – the management mechanisms geared towards increasing the material well-being of the population at large. Following “collective action theory” (Blanton and Fargher 2008, 2010), there must have been negotiation and/or benefits for conformity with leadership goals that extend beyond any “moral imperative” associated with simple dynastic rule. While early occupation at the site – a time associated with dynastic rule – is characterized by distinct and differentiated social status, Late Classic Caracol – a time when there is lessened evidence for dynasty – is marked by collaboration.

There are stresses associated with increased population density and settlement size (Fletcher 1995). We believe that Late Classic Caracol successfully managed these stresses through a series of collaborative adaptations. We suggest that the results of these actions can be seen in the Caracol landscape, particularly in physical manifestations that are different from a more typical Early Classic Period settlement norm. For example, settlement at Caracol does not focus on contiguous residential groupings as is the case at sites like Tikal and Copan. Rather, Late Classic Caracol settlement generally is evenly spaced across the landscape (Figure 3). While immediate and proximate access to relatives may have been lost in this settlement decision, enhanced access to productive terraced agricultural land was gained.

The full integration of ancient Maya household settlement with agricultural terraces that is found at Caracol appears to differ from patterns found in other tropical

landscapes (Figure 5). In Southeast Asia, extensive terracing was constructed for use in rice cultivation (Conklin 1972, 1980), but these fields were separated from human settlement, which tended to coagulate in discrete villages. While Angkor Wat may have integrated households with rice cultivation (much like the Maya landscape) over some 900 square kilometers in a river basin (Fletcher et al. 2008; Pottier 2000), this is not the usual settlement pattern that occurs with the terraced rice fields. Similarly, in the Bolivian Amazon of South America, out of a wide variety of Pre-Columbian agricultural landscapes (Erickson 2006; Walker 2004), raised fields along the Iruyañez River were separated from areas used for human settlement along the river levees. While the suggestion has been made that the dispersed settlement of the Maya was undertaken for health reasons (Drennan 1988), the dispersed placement of Maya household groups in the midst of continuous agricultural fields also provided some privacy within their anthropogenic landscape – perhaps more than was found in other tropical regions where human habitation was clustered into more compact villages.

Caracol's roadways also easily integrated the dispersed settlement. The radiating causeway system at Caracol provided communication among residents and greater prosperity through access to goods at various localized termini market areas. This structure left household production in place, but increased distribution of trade items (such as polychrome pottery and obsidian) as well as local goods (such as Belize Red ceramics). Resulting from this negotiation were not only distinct physical features on the landscape – such as a unique causeway, settlement, and agricultural system – but also distinct ideological and social factors, especially as seen in mortuary and caching practices (A. Chase and D. Chase 2010; D. Chase and A. Chase 2010). Collective action led Late Classic Caracol to utilize a system of symbolic egalitarianism where

residents shared prosperity and identity (A. Chase and D. Chase 2009).

That these adaptations - along with Caracol's peak occupation, density, and territorial extent - occurred at a time when public dynastic records were not emphasized is likely not a coincidence. We postulate that the ensuing political reorganization that occurred at Caracol during the late Late Classic Period presaged the more collaborative Protohistoric Yucatec political structure, where political control changed every katun or 20 years (Restall 1997:65). In breaking with strict divine kingship, we believe that a system based on collective actions provided the framework for Caracol's growth and prosperity. However, at the onset of the Terminal Classic Period, political tensions re-emerged that can be correlated with a subsequent general decline in social prosperity and political stability at Caracol. Hieroglyphic records and archaeological data suggest a changing focus around A.D. 800 – one that did not favor the collective. As dynasty resurfaced on the monuments, general prosperity and symbolic egalitarianism deteriorated; population numbers and political unity also waned. Ultimately, Caracol was abandoned. Subsequent Late Postclassic site size and density elsewhere in the Maya area was lowered, returning to what are considered to be more typical levels (see Smith 2005). Late Postclassic artifact and caching practices suggest that some lessons may have been learned from the Classic Period Collapse (D. Chase and A. Chase 2004b). However, that is yet another story.

Conclusion

In conclusion, the addition of LiDAR to our existing tool kit of texts, excavation, and on-the-ground survey provides a significant advance to our understanding of ancient Maya socio-territorial organization. LiDAR effectively shows the scale of human modification of the Caracol landscape – in terms of residential settlement, agricultural terracing, and causeway construction – and more clearly defines ancient Maya urbanism. These data also point to the need

to look in depth at settlement systems in making interpretations about polity and territory. These combined data highlight the breadth of ancient Maya human-environment interaction, the adaptability of Late Classic culture, and the fragility of subsequent Terminal Classic period adaptations.

¹The term “node” is used to refer to concentrations of monumental architecture or plaza groups at the end of causeways. While in some areas within the Maya lowlands, these locales might be referred to as “sites” or “minor centers,” their location and context – embedded within a continuous settlement system – suggests that these value-laden terms are inappropriate.

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6 **CALCULATING LATE CLASSIC LOWLAND MAYA POPULATION FOR THE UPPER BELIZE RIVER AREA**

Anabel Ford, Keith C. Clarke, and Sebastian Morlet

The problem of estimating ancient Maya populations has vexed archaeologists since the first temples were discovered, and existing best estimates range considerably. Using a probability map of Maya settlement patterns derived from predictive Bayesian modeling of the Upper Belize River Area, we have developed a means of estimating populations in the unknown areas. Using the ancient land use patterns of residential units revealed in surveyed areas, we expanded our model across a greater area, creating a probability map of all Maya sites of the area, discovered or not. Based on a classification of the sites and demographic assumptions about the average family, we derive estimates and their ranges of population for the Late Classic Maya that reveal an intensive land use system.

Introduction

Estimating Maya population numbers throughout their settlement history in Central America has been a preoccupation of Maya archaeologists for nearly a century. Contemplating the abandoned, forest-covered temples and the numerous smaller platforms that appeared to be everywhere, gave rise to a rich variety of interpretations. Yet it was the focused attention on the major architecture and the abundance of the smaller structures that led researchers to envision a dense and widespread system of Maya settlement.

As first noted by Bullard, as one looks beyond the temples and plazas variation in Maya settlement forms and configurations can be recognized (1960; see also Fedick 1995; Fedick and Ford 1990; Ford 1991; Iannone and Connell 2003; Isendahl 2002; Sabloff 1992; Smyth et al 1995; Webster 2008). Still, the perception remains of vast cities surrounded by their sustaining rural hinterland habitations (Rice and Culbert 1990 following Redfield 1967). Estimates for Late Classic settlement densities also appear to reflect this division (Rice and Culbert 1990:30-31). Yet this distinction is possibly more structured by our own experiences of contemporary urbanization, and not by actual evidence from the ancient Maya landscape, where the perceived urban/rural dichotomy falls short of describing the diversity of Maya settlement (Ford 1991; Levi 2002). It is hard to evaluate the efficacy of the dichotomy, however, since archaeological surveys are

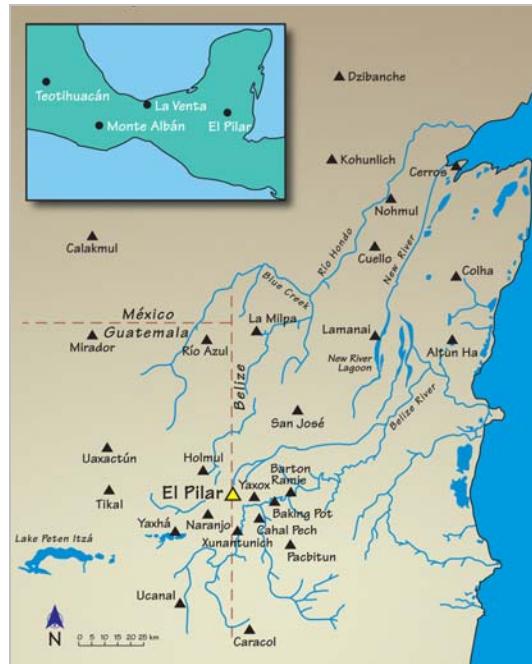


Figure 1. The Central Maya Lowlands with Sites indicated.

obstructed by the density and isolation of the Maya forest itself. Centers ranging in size from the large site of Tikal to the residential community of Barton Ramie (Figure 1) relied on the landscape for their subsistence needs. In this research we sought answers to questions of how the Maya used their land, and consequently, how they chose to settle and farm the landscape. With answers to these questions, estimates of ancient populations become feasible.

The nature of settlement patterns and densities suggests nuances that can only be revealed by a more detailed examination of



Figure 2. The Upper Belize River Area with Study area indicated.

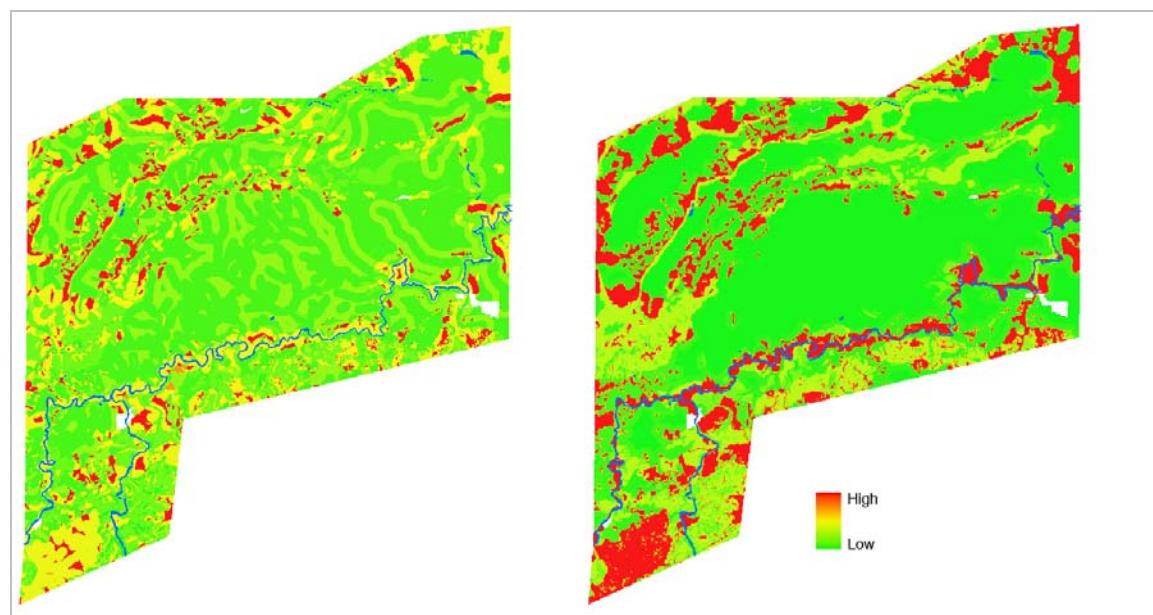


Figure 3. Comparison of the Original Model (L) with the New Model (R).

the Maya landscape. In prior work, we created an assessment for Maya sites of the Upper Belize River Area with the development of a predictive model using geographic variables (Ford and Clarke 2006; Ford et al. 2009). This research involved extensive data correlation, building a model based on Weight-of-Evidence (Bayesian) predictive methods, application of the model, and its validation through field testing. The model proved highly successful in predicting both the greater and lesser presence of Maya settlements (Ford, Clarke, and Raines 2009).

Our work with Maya settlement patterns offers a new perspective that builds on the constellation of environmental characteristics commonly associated with ancient patterns of settlement (Campbell et al. 2006). Put simply and in local terms, well-drained ridges within the tall canopy forests had high settlement densities (Ford 1986:68-69, 88, 1991); poor-drained lowlands with short forest had low settlement densities; and seasonally inundated and perennial wetlands had no settlement (Fedick and Ford 1990). Given that the Maya civic centers are perched within well-drained areas and that the general non-central surveys incorporate the variety of landforms, it may be that the proportions of varied environmental characteristics explain the differences in densities. High densities around major centers such as Tikal were located in areas with a high proportion of well-drained terrain; archaeological surveys that surround such centers will therefore represent well-drained ridges and high settlement densities. Broader estimates based on these densities if extended will overestimate populations. Intersite areas, such as those located between Tikal and Yaxhá, incorporate different environmental zones ranging from ridges to wetlands (Ford 1986; 2003) and yield average settlement densities lower than that of Tikal, for example.

When the environmental characteristics are taken into account, there is a wide variation. These variations may be difficult

to appreciate from the perspective offered via a survey transect, but Geographic Information Systems (GIS) offers a means to identify patterns and produce maps based on samples of identified settlements and patterns. This is how we constructed a predictive model of Maya settlement for the Upper Belize River Area (Ford and Clarke 2006, Ford et al 2009). The results of the GIS research forms the basis of this further effort to calculate Maya population density and distribution.

We begin with an assessment of the predictive model of Maya settlements as a basis for the extrapolation of settlement and residential patterns. Refining our predictive model to build the population estimates, we used the transect surveys for the Belize River Archaeological Settlement Survey (BRASS), along with additional surveys of Barton Ramie, to characterize residential configurations and settlement patterns across the wider Upper Belize River Area. The recognized patterns are then propagated from the actual surveys to the broader map, based on the predictive model using the GIS.

Populations were estimated on the basis of defined residential units plotted with the GIS to create the broader settlement map. To calculate population, we develop a strategy to first determine primary and secondary residence derived from ethnohistoric and ethnographic cases. The results provide both a view of how settlement and population vary across the landscape and also present a picture of high population levels and intense land use for the Late Classic Maya.

Predictive Model Map of Ancient Maya Settlement Patterns

Over the past several years, we have been working with the results of a predictive model of Maya sites drawing on data gathered in the GIS (Ford and Clarke 2006, Ford et al. 2009; Merlet 2009, 2010). Focused on the data gathered by the BRASS research, where three basic transects in the western portion and targeted quadrants to the east were designed to gain an

Tool	Parameter	Result
Training sites for	Training points	Random Sampling of Training Points
Calculate Weights	Raster of Training Points	Table of Weights for Evidential Layers
Calculate Probabilities	Raster of Weights	Calculated Posterior Probabilities
Logistic Regression	Raster of Weights	Calculated Regression Statistic
Weights of Evidence (WofE)	Raster of Weights	Calculated Weights of Evidence
Agterberg-Cheng Test	Posterior Probability Standards	Test Conditional Independence
Area/Frequency Tables	Posterior Probability Training Points	Table of the Predictive Model

Table 1. Geographic Information System Database for the Predictive Model of Maya Settlement (Merlet 2009).

appreciation for the variation of settlements in the alluvial valley, the rolling marl foothills and the well-drained ridges to the north. Before the BRASS study, Maya studies concentrated in the valley suggested that settlement was a ribbon line pattern only along the river (Coe and Coe 1956; Thompson 1942; Willey et al. 1965). This view is now altered and we have a more complex understanding of settlement patterns today. Thus we can compensate for the sampling bias of prior sites selected too close together.

Based on the BRASS research, we have developed a predicted map of the c. 1300 sq km of the Upper Belize River Area that predicts sites and their density at a 96% confidence level (Figure 2 and 3). Based on the known sites and their relationship to the geographic variables of soil fertility, soil drainage, distance from rivers, and topographic slope, we constructed a predictive map based on the steps outlined in Table 1.

The original tests (Ford et al. 2009) applied a model training mask that bounded all the transect areas (Ford et al 2009:8) for the Upper Belize River Area and included rivers as a geographic theme. In our present model, we have refined the focus by recreating the training mask coverage to bound precisely around only those areas with survey coverage, thus we control for locations with sites as well as for those areas without sites (Merlet 2009:16-17). The results provide a more powerful model with the quality of predicting not only the

presence of sites but also the absence of sites.

In the final model refinements, experiment results were compared with and without the coverage of rivers. We found that the interaction of the river coverage was clouding patterns of land use, especially where there was a low probability of settlement (Ford et al. 2009: 12-13). The relation between rivers and sites was found to be complex, positive at some distances and negative at others. Evaluating the reliability of the models with and without the river coverage, we determined that we had better predictive results without the rivers.

The validation of the predictive model used successive field tests based on the initial models (Monthus 2004; Ford and Clarke 2006; Ford et al. 2009). Unsurveyed areas were field visited and site locations were plotted with a Global Positioning System (GPS) receiver and mobile GIS. These site validations were used to refine a final model and provide the new probability map (Figure 3). Our current model results use the detailed mask of the actual survey areas and only three geographic variables: soil fertility, soil drainage, and topographic slope. With these, our predictive map is statistically both highly explanatory and robust.

Domestic Architecture and Residential Units in the Upper Belize River Area

From the outset, ancient structures have been used as a proxy for houses and their

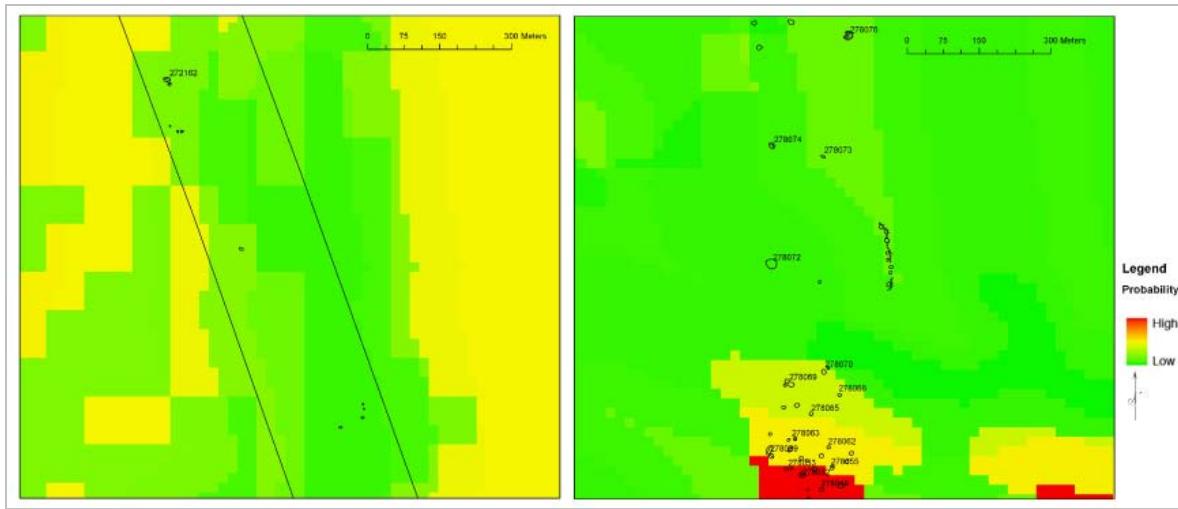


Figure 4. Results of the Predictive Model for Low Priority Zones on the BRASS River (Pilar (L) and Yaxox Transect (R)).

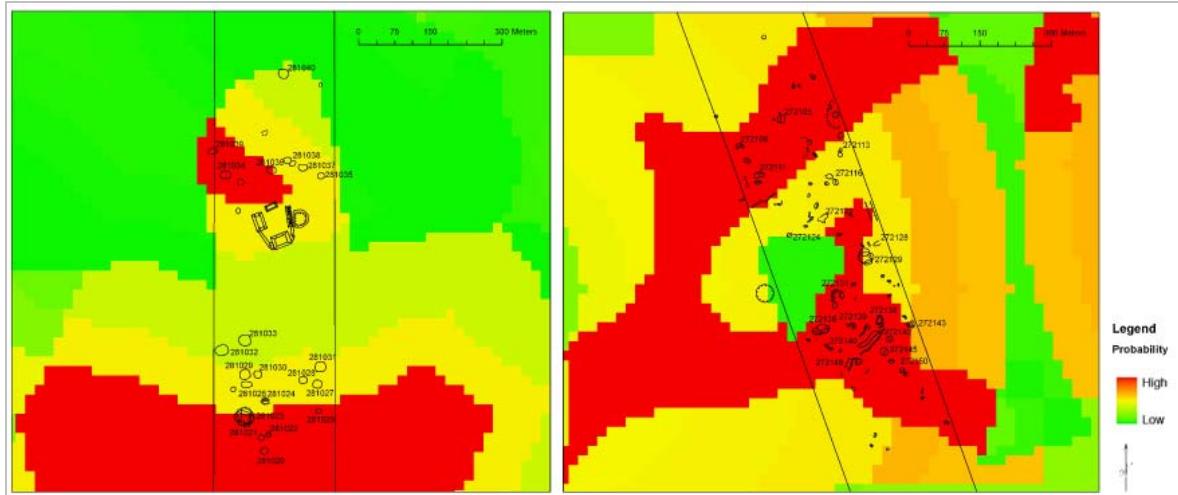


Figure 5. Results of the Predictive Model for High Priority Zones on the BRAa Transect: Valley and Ridges (Bacab Na (L) and El Pilar Transect (R)).

inhabitants, linking to the obvious relationship of residential structures and families. The move from domestic architecture to homes and people has vexed archeologists and caused much discussion in the archaeological literature (see Culbert and Rice for a bibliography). Any estimation system is fraught with problems and assumptions that influence the results (Turner 1990). Our attempt here is to incorporate the standard system of calculation based on a new strategy of defining permanent residential units. We feel that the traditional survey data are a

fundamental starting point, and are both valid and comparable (Helay et al. 2007).

At present, we do not concern ourselves with the invisible remains for precisely that reason, they are invisible. This does not discount the many issues raised about such a problem (see Johnston 1992, 2002), but does emphasize that we are basing the estimates on visible remains only. Indeed, we see the variety of visible residential configurations and their spatial distribution as important, considering groups as distinct from solitary structures a critical point and considered in our definition of primary residential units

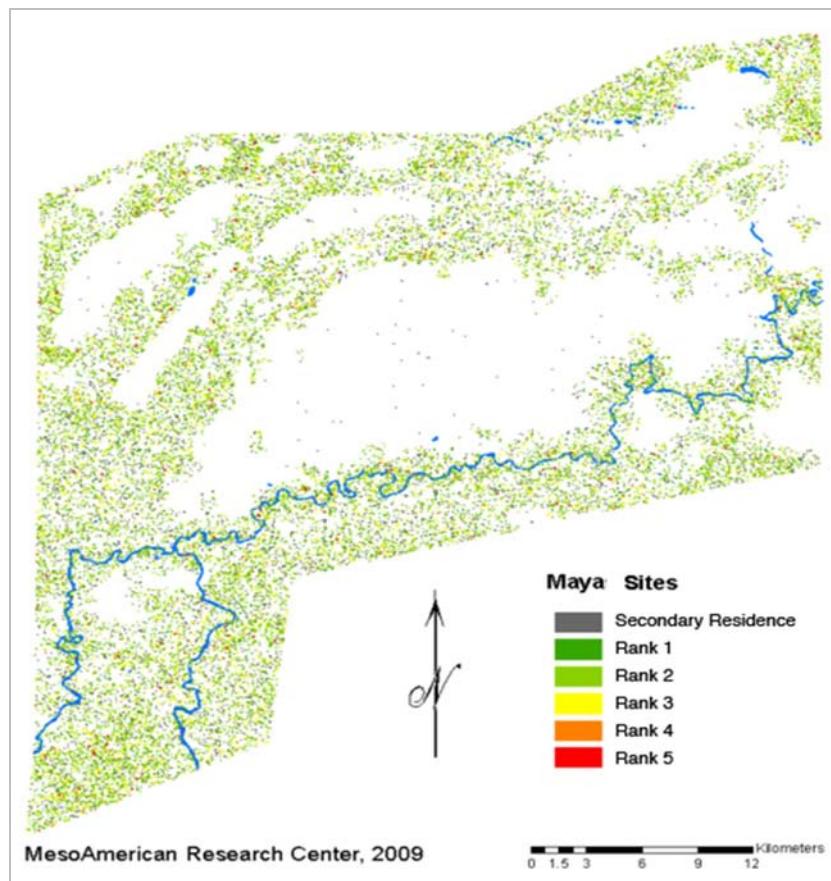


Figure 6. The Residential Unit Distribution for the Upper Belize River Study area.

(Willey 1956; Ashmore 1981; Levi 2002, 2003).

We set up an approach to classify the nature of the domestic architecture based on the requisites of a basic house of the Maya area (see Wachope 1938 as an example). We take the position that the recorded surface remains provide a foundation for estimations of land use intensity and population density in and of themselves. We are comparing similar features when we discuss visible architectural remains, as surface remains provide a common comparative base.

We use the recorded remains of domestic architecture from the archaeological surveys of the BRASS program (Ford 1985, 1990; Ford and Fedick 1992), along with the Barton Ramie map (Willey et al. 1965) to generalize over the whole Upper Belize River Area. This required the identification of residential sites, the consideration of size, the

understanding of composition, and the location based on the predictive model. For our map, we consider the site locations based on the BRASS surveys of the 1980s, including the three transects as well as the ancillary surveys conducted in peripheral areas (Fedick 1988) and the Barton Ramie map (Willey et al. 1965). Based on these site locations and their association with the predictive values generated by our GIS model, we have been able to propagate predicted patterns of settlement across the landscape. These patterns have been validated at the 96% confidence level (Ford et al. 2009:13).

With the BRASS residential database, we used recorded data on structure size (diagonal length in m), residential unit composition (number of structures and evidence of plaza), labor investment (calculated based on Arnold and Ford 1980), and the location to compute the weights of

Total Population Distribution of BRASS Transects						
WofEClass	Residential Units	Area (km ²)	Population	Density	% Population	% Area
1	0	2.01	0	0	0%	22%
2	11	0.51	64	124	3%	06%
3	28	1.20	154	129	8%	13%
4	53	1.57	298	190	15%	17%
5	259	3.72	1452	390	74%	41%
Total	352	9.01	1968	218	100%	100%

Table 2. Population Distribution of BRASS Transects.

Total Population for the Study Area						
WofEClass	Late Classic Residences	Area (km ²)	Population	Density	% Population	% Area
1	0	485	0	0	0%	38%
2	5403	243	30255	124	17%	19%
3	1753	76	9818	129	5%	6%
4	7643	225	42800	190	23%	18%
5	17808	256	99727	390	55%	20%
Total	32607	1284	182600	142	100%	100%

Table 3. Total estimated Population for the Study area.

evidence statistic. These residential unit variables were then used to propagate the patterns on the map.

Using the labor investment calculation (LI) originally developed for the Tikal map (Arnold and Ford 1980), sites were ranked from 1-5 based on a calculation that takes into account the size and number of structures and the presence or absence of a plaza. This provides the basis for distributing sites and considering their overall impact on the landscape.

While the presumed house sites have been accepted as such, how to use the house sites as a proxy for population has been fraught with problems. Patterns of subsistence agriculture have demonstrated that families that occupy residential units

evoke varied strategies that typically involved several residences (Farris 1984; Fedick 1992, 1996; Zetina and Faust In Press; Netting 1977; Redfield and Villa Rojas 1962; Steggerda 1941; Villa Rojas 1945; Zetina 2007). In fact, recent ethnographies of the Maya suggest an average of three residences per family based on the seasonal round of agricultural activities (Zetina and Faust In Press; Zetina 2007), thus creating a pattern of multiple residence based on agricultural demands in the field.

Based on the ethnographic studies, we consider that the very small structures would have served secondary domestic services and should be excluded from the estimation of population. Thus, solitary structures with

an LI less than 500 with diagonals averaging c. 10 m, were designated as secondary residences. These secondary residential units composed 41% of the BRASS sample, but only c. 26% of mapped structures. The residential units with LI greater than 500 and an average unit diagonal of c. 24 m were designated as primary residential units and provided the basis for our population calculation. The primary residential units composed 59% of the domestic architecture of the BRASS surveys.

Propagating Maya Settlements Across the Upper Belize River Area

The identification of primary and secondary residential units in the BRASS and Barton Ramie surveys were used to propagate patterns of residential settlements proportionally across the entire Upper Belize River Area. The propagation used the probabilities of our predictive model as the foundation. We used the residential site classification by labor investment rank (LI; Ford and Arnold 1980) as they patterned in the surveys. Figures 4 and 5 provide a sample of the relationship of the predictive model and the Maya settlement in the Upper Belize River area. The first pair of images (Figure 4) shows the low priority areas and the nature of settlement in those areas. The second pair of images (Figure 5) shows the high priority areas and the patterns of those areas. The variations in the densities, the composition of the residential units, and their size and configurations, were categorized and schematically coded for the propagation to the larger mapped area. Based on the nature of residential settlement in these surveyed areas, we propagated residential sites to the larger map of the Belize River Area using random simulation.

Based on the predictive map, we tallied residential sites that qualified as primary residential units and then used the standard proportion of occupation in the Late Classic period of 95% to build the map. This is consistent with the BRASS data (Ford 1985; Ford et al. 2009:14). From this we were able to associate the residential units with the predictive zones (classed from the WofE

or Weights of Evidence model predictive probabilities) to create a table of the population distribution (Table 2). To generate our population estimation for the Upper Belize River Area, we use the generally accepted standard of 5.6 persons per residential unit (Narroll 1962; Puleston 1973; Turner 1990; Healy et al. 2007). Turner (1990) argued that this is a conservative estimation for “paleotechnic agrarian economies” (Turner 1990:305).

The result of this process produced a map that provides a picture of the distribution and a view of the concentrations of settlements and populations in the Belize River Area (Figure 6). Distributions are diverse and we can see how areas of concentrated settlements in the east, south, and the northwest demonstrate where elite controls should be manifest.

Using the tools of the GIS and the predictive model, we were able to use the distribution map (Figure 6) to develop a table of residential distribution for the entire study area of the Upper Belize River area (Table 3). The distributions of the BRASS surveys are the basis of the new map that is the foundation of the population estimations. This new map provides the probability distribution of Maya sites at the 96% confidence level. The landforms and predictive zones are of different proportions in the whole study area when compared with the BRASS transects. The predictive zones, however, are represented in the BRASS transects and the validation of the model includes the Upper Belize River Area (see Ford et al. 2009:14-15).

The population estimates for the Upper Belize River Area are substantial. The range is extreme: 0 persons per sq km in areas of lowest probability (38% of the area) to 390 persons per sq km in the highest probability zones (55% of the area). The overall average is 142 persons per sq km, a density that is significantly greater than the early estimates (Turner 1990:317) but within the range that has been estimated for the Late Classic period (Culbert and Rice 1990). This is relatively dense by Boserup's (1981:9-11) reckoning. The density estimated for Ming

Dynasty China at 1500 AD? is estimated at only 64 persons per sq km and pre-modern Japan at 1750 AD is roughly 128 persons per sq km. Rosenberg (2010) summarizes our world's current population density by continent:

North America - 83 people per square kilometer
 South America - 189 people per square kilometer
 Europe - 347 people per square kilometer
 Asia - 525 people per square kilometer
 Africa - 168 people per square kilometer
 Australia - 17 people per square kilometer

Boserup (1981:9), in her synthetic treatise on population and technology, evaluated population densities worldwide and determined that density greater than 64 are dense and over 256 very dense. She presented a table of continental densities based on the conditions in 1975. The dense and very dense categories are only found in Europe and Asia (Boserup 1981:11).

Reviewing our population estimates for the Late Classic Maya of the Upper Belize River Area suggests a very intensive use of the landscape. In the c. 1300 sq km that was studied, 182, 600 people must have lived and farmed. Yet while areas of the greatest density reach 390 per sq km, very dense by Boserup's calculations (1981:9), this encompasses only 20% of the area. Consequently the most intense land use takes in only one-fifth of the terrain. This small percentage would be a complex mosaic of houses, varied open sunlit areas of maize fields and home orchard gardens, as described in the ethnographic literature (Redfield and Villa Rojas 1962; Zetina 2007). These dense settlement zones found throughout the study area are both near and far from major and minor centers. They contrast with the virtually unoccupied areas of low settlement priority making up 38% of the study area. These extensive unoccupied zones, encompassing nearly two-fifths of the study area, would have been woodlands, thus supporting the natural resource needs of the Maya.

Summary

There have been many strategies used to develop population estimates for prehistoric societies. The Maya have presented one of the more difficult cases as the tropical forest cover limits surveys. New satellite and geospatial technologies have sought to overcome these obstacles (e.g. Garrison et al. 2008), and in the future we may have an opportunity to test our land use model with these more sophisticated capabilities. Our predictive model provides one way to address land use based on statistical probabilities (Ford and Clarke 2006; Ford et al. 2009).

With the new population density map based on our predictive model, we demonstrate in this paper a means to create a settlement map using archaeological surveys and their patterns against a predictive model map that may have used beyond our context. While it has been recognized that settlements are not evenly distributed, our map is based on geographic variables on which the settlements are dependent. By enumerating the proportions of residential units and propagating their distribution across the landscape from the known areas to the predicted areas, we have derived the patterns of primary and secondary residential sites. Our total estimates project 142 persons per sq km for the whole study area, with a range of 0-390 persons per sq km. The estimates we have come up with are approximately ten times the population density of Belize today.

These population estimates are founded on a series of assumptions. We recognize the subsistence farmer's strategy of using primary and secondary residences, and have made our calculations based on the primary residential units alone. We use 95% occupation commonly used for the Maya area in the Late Classic period, comparable to Late Classic occupation in the area. With all these considerations taken into account, we have discovered that the density of occupation of the Upper Belize River Area was potentially very high. We believe the results of our research provide an understanding of how the landscape was

used. We present a mosaic of intensity based on the geographic variables of the Upper Belize River Area. We show areas of intense use and areas that are largely unoccupied. This variation is acknowledged but had not been well appreciated. Our model demonstrates that high settlement and population densities are not something confined to the urban civic centers, but occur where the constellation of geographic variables coincide: well drained fertile soil areas with moderate slope (Ford et al. 2009). Access to natural water sources was only a minor factor (Merlet 2009). Settlements with high predictive values would be good candidates for civic center presence. This could be tested by further field surveys.

To support an estimated population of 142 persons per sq km, a successful subsistence economy was required. The investments that began to take shape in the Preclassic before 1000 BC and grew over two millennia must be able to account for this intense land use pattern. We propose that the *forest garden milpa cycle* (Ford and Nigh 2009) was the subsistence base that could provide a long-term sustainable subsistence base for the Upper Belize River Area Maya. Our next step will be to build a model of Maya land use based on the Forest Garden Milpa cycle and the food and resources it could supply.

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7 PATTERNS OF POPULATION MOVEMENT AT XUNANTUNICH, CAHAL PECH, AND BAKING POT DURING THE LATE AND TERMINAL CLASSIC (AD 600-900)

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Recent advances in bone chemistry document substantial population movement in the Maya lowlands, but scholars still know little about how migration was structured or how frequently it occurred. Settlement patterns in the Belize River Valley document a significant increase in population density during the Late and Terminal Classic periods. This may have included population movement through the same interaction spheres evidenced by ceramic, architectural and burial styles. This paper compares patterns of population movement at three major centers in the upper Belize River valley using strontium isotope values in the tooth enamel of 62 individuals as correlates for migration. Thirty-five baseline samples for the Belize River Valley and neighboring regions, which show values not identified elsewhere in the Maya lowlands, are used to identify potential origins for the non-local individuals. Migration patterns at Xunantunich, Cahal Pech, and Baking Pot show significant differences in the rate and direction of population movement - from 0.5 to 40% - with in-migration from multiple regions at two of the three sites. Non-local individuals are present in diverse burial contexts, but migration patterns do not directly mirror the sociopolitical relationships suggested by epigraphic and material evidence.

Introduction

Population movement forms an important part of many changes that occurred during the Late and Terminal Classic in the upper Belize River valley, from the increase in settlement density after AD 600, to the large-scale depopulation of the region that occurred by the end of the Terminal Classic (~AD 900). Movement likely occurred between both neighboring and distant regions and sites in the valley, as well as between settlements and cities within it. However, like most areas in the lowlands, migration patterns remain poorly understood.

Migration is an especially important topic for scholars of the ancient Maya. Myriad explanations exist for the collapse of the sociopolitical system during the Terminal Classic, but population movement is the defining feature of this period in every region. It is necessary to understand demographic processes prior to the collapse to make sense of the subsequent changes. How common was migration in the upper Belize River Valley, and does population movement mirror epigraphic and material evidence for interaction between polities? Did population movement differ among elites and commoners, or men and women? The social networks created when people

move also carry goods, ideas, and sometimes conflict, forming the basis for interaction within and between regions.

This study compares migration patterns at three major centers, Xunantunich, Cahal Pech, and Baking Pot, using strontium isotope values as correlates for population movement. Values identified in the tooth enamel of 62 individuals interred in monumental architecture, residential shrines, and households, show that both interregional and local population movement occurred. A description of the history of the region is followed by an explanation of how migration is defined and identified. Results are presented in two parts: 1) new strontium isotope baseline data, and 2) a summary values in the human population, which show that migration patterns differed substantially at each site, reflecting distinct sociopolitical alliances and histories.

The Upper Belize River Valley

Major centers are located approximately every ten kilometers along Belize River (Driver and Garber 2004), and are surrounded by minor centers and hinterland settlement which formed a densely populated landscape (Figure 1). Shared ceramic styles suggest intensive interaction between sites in the region, with strong ties

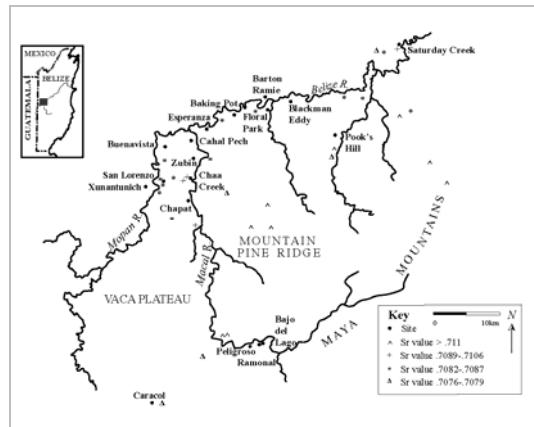


Figure 1. The inset shows the location of the study area in Belize, and the map shows the location of strontium isotope baseline values and the sites in the study.

to the Central Petén (Aimers 2004: 311), and the region likely was affected by the shifting relationships between Caracol, Calakmul, and Naranjo (Ashmore 2010; Ball and Taschek 2004; Helmke and Awe in press; Leventhal and Ashmore 2004; LeCount and Yaeger 2010). It is reasonable to posit that population movement also occurred, but recent studies suggest that shared material culture may not always signal migration (Buikstra et al. 2004; Price et al. 2008; Wright 2005a).

Non-local ceramics are the most visible evidence for interaction, and show a relationship between Naranjo and Buenavista, Baking Pot, and Xunantunich during Late Classic (Helmke and Awe in press). The Belize Valley may have been part of the greater Naranjo area (Ball and Taschek 2004; Helmke et al. 2010), and the most intensive interaction is visible at Xunantunich. Iconographic and architectural evidence document a political visit, and possibly the installation of the royal household at the Xunantunich palace under the auspices of Naranjo rulers (Helmke et al. 2010; Yaeger 2010). This relationship may have included immigration, as suggested by the remains of a young male at the palace compound that may represent the sacrifice of a captive, and labor needs for an extensive building campaign (Yaeger 2010).

A lack of non-local goods at Xunantunich suggests that interaction with elites at other polities was uncommon (Jamison 2010; LeCount and Yaeger 2010). While Central Petén style ceramics are present at sites across the upper Belize River valley, these vessels are produced locally at Xunantunich. Non-local ceramics form only 2% of the assemblage (LeCount et al. 2002). In contrast, ceramic exchange shows interaction at Buenavista with Holmul, La Rejolla, and Calakmul (Ball and Taschek 2004), and with Holmul, Pusilha and the Motagua Valley at Baking Pot (Reents-Budet et al. 2005).

Within the Belize Valley region, Ball and Taschek (2004) see a close-knit relationship between Xunantunich, Cahal Pech, and Buenavista, with a shared lineage governing the three centers. Movement between sites located along the Belize River is not visible isotopically, but ceramic exchange documents elite interaction between Buenavista and Baking Pot (Reents-Budet et al. 2000). These interactions were not always friendly, as shown by the destruction and desecration of structures in the Xunantunich polity (Yaeger 2010).

Influence from Caracol also was important, and is visible in cache and burial practices at Cahal Pech and Baking Pot, as well as other sites in the valley (Helmke and Awe in press; LeCount and Yaeger 2010). Caracol's influence was more prevalent earlier during the Late Classic at these sites, but is noted later at Buenavista, after Naranjo's influence in the valley waned (Chase 2004). The nature of interaction with residents of the sparsely populated Maya Mountains is not known, but use of resources was widespread (Graham 1987) and at least one individual with a Maya Mountain origin is identified at Tikal (Wright 2005b).

While epigraphic, iconographic, and material evidence suggest that trade and warfare were common (Aimers 2004), these do not provide direct evidence for migration. Elite goods also fail to provide information about non-elite mobility, which is an

important consideration given that gaining and securing subjects in the Maya lowlands must have been a key concern for competing elites (Inomata 2004:190). Likewise, the ability to relocate and take advantage of better opportunities likely was crucial for farmers. It is important to identify migration directly, which is possible using a variety of biogeochemical measures.

Identifying Migration

Archaeologists generally use the term migration to describe long-distance, unidirectional movement by groups of people. It is perceived as an event, with a beginning and an end that signal a cultural shift, like the spread of farming across Europe. As a result, archaeological models of migration offer limited discussion of movement within populated areas (e.g., Anderson and Gillam 2000; Blitz 1999; Cameron 1995, Ezzo et al. 1997; Killgrove 2010; Pauketat 2003; Snow 1995). However, scholars in other disciplines use migration as an umbrella term that is not limited to long distance movement, but includes local and regional relocation as well. In its most basic form, it is defined as crossing a political boundary (Cadwallader 1992; Cameron 1995; Finnegan 1976). This can involve a long or short distance, as a move to a neighboring community for marriage can involve as great a social transition as one hundreds or thousands of miles away (Hoerder 2004).

The modern definition can be employed archaeologically because studies of both ancient and modern population movement posit a similar, kin-based structure. The decision to move – regardless of cause – is based on access to information about conditions and opportunities that are relayed person-to-person. These personal networks can be maintained for generations, providing potentially great time depth for migration networks once they are established (Coombs 1979; Denich 1970; Jedlicka 1979; Wilson 1998).

This study defines migration as a change in residence between two basic stages in a person's life: early childhood residence and

the end of life. This includes local, regional, and long-distance relocation. While it does not identify multiple moves or mobility that was temporary, it is the first step in reconstructing basic patterns of population movement. It may be possible to identify some specific types of migration, like residential mobility or involuntary movement, like the capture and sacrifice of a warrior. However, understanding causal factors is hard in living populations, and is even more difficult in one represented only by burials.

Bone chemistry methods have been used to identify migration across the globe during diverse time periods and populations, from Neanderthals, to Neolithic farmers and Native Americans (e.g., Buikstra et al. 2004; Ezzo et al. 1997; Killgrove 2010; Knudson 2004; Price et al. 2008, 2001, 2000; Richards et al. 2008; White et al. 2007, 2000). Values in tooth enamel, which forms during infancy and early childhood, are compared to those of the burial location. Tooth enamel is considered to be less subject to diagenetic alteration than other tissues (Price et al. 2008). Local values are established using a statistical comparison of human values and the range of baseline values established for each site. A difference between the birth and burial values demonstrates long-term relocation. Samples were prepared at the UW-Madison Laboratory for Archaeological Chemistry following methods described by Wright (2005b).

Strontium isotopes serve as useful correlates for population movement because variation in the ratio of strontium-87 and strontium-86 ($^{87}\text{Sr}/^{86}\text{Sr}$) corresponds to broad cultural divisions in Mesoamerica (Hodell et al. 2004; Price et al. 2008). The composition of the rock formation and its age determine the extent to which radioactive rubidium-87 decays into strontium-87, causing variability in strontium isotopes in different geologic formations (Ericson 1985; Faure and Powell 1972). The average $^{87}\text{Sr}/^{86}\text{Sr}$ of a region is a product of inputs to soil formation, including aerial and fluvial processes and

differential weathering of rock formations (Bentley 2006). The lack of biological fractionation, and the slow rate of radioactive decay over billions of years, produces the same value in regional soils, plants, and animals, both ancient and modern. Each consecutive trophic level has a better average value for the region (Krueger 1985).

Values decrease from the northern Yucatan, where the Cretaceous period marine limestone matches the value of seawater when it was formed (.7092), Palmer and Elderfield 1985), to the Central (.708) and Southern Lowlands (.7075). Metamorphic formations near Copan have an average value of .706, while the volcanic-derived soils of the Pacific coast are markedly lower (.704) (Hodell et al. 2004; Price et al. 2008). The Maya Mountains, the oldest geologic formation in the region (Cornec 2008), have high values that exceed .711.

However, geologic differences in Belize change over distances <20km apart, creating four zones with distinct $^{87}\text{Sr}/^{86}\text{Sr}$ values. Two of these zones have values not identified elsewhere in the Maya region. Thirty-five faunal samples (Figure 1) show how biologically available strontium values reflect an average of local $^{87}\text{Sr}/^{86}\text{Sr}$ values (Price et al. 2002, Bentley 2006). This makes it possible to distinguish both long-distance and interregional movement.

Values in modern fauna sampled along the Belize River range from .7082 to .7091, with an average value of .7086 (Figure 2). Neighboring regions have distinct values. Modern fauna and plants sampled in the Mountain Pine Ridge and Maya Mountains have values that range from .7114 to .7255 (mean value .7179). A third strontium zone has intermediate values: three samples taken from the ancient floodplains along the Macal River range from .7089 to .7107 (.7010 average). Human values in each region reflect these values (Freiwald nd).

In contrast, four values from the Vaca Plateau range from .7076 to .7078 (average .7077). This zone represents a transition from strontium isotope values in the Central

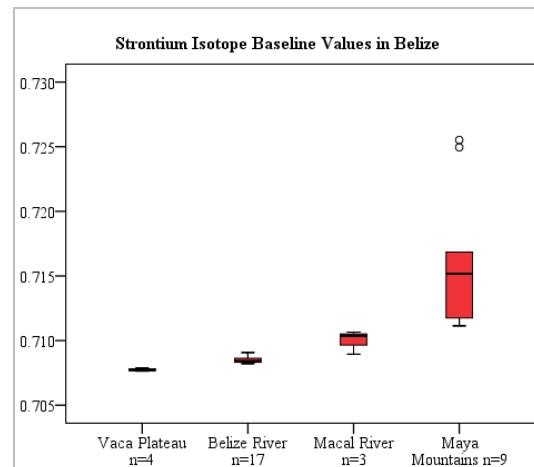


Figure 2. The interquartile range of the faunal samples shows the four distinct strontium zones in and around the Belize Valley region.

and Southern Lowlands. Central Lowland values in plant and rock samples average .7079 near the Mopan River and at Tikal, while values average .7078 near El Pilar (Hodell et al. 2004). In contrast, .7076 average values are reported for humans living in the Southern Lowlands at Seibal and Punto de Chimino (Wright and Bachand 2009; Krueger 1985).

Population Movement in the Upper Belize River Valley: A Comparison of Three Sites

The sample population in this study shows a different picture of migration at each site. First, most individuals have $^{87}\text{Sr}/^{86}\text{Sr}$ values within the range of baseline values in the Belize River Valley (.7082 and .7091). These are described as local, which is used only to reference isotope values, not ethnic or cultural differences. A number of individuals have values slightly higher or lower than baseline values. These are considered local in this analysis. The rate of migration is higher at Baking Pot and Xunantunich if these individuals are instead considered migrants. Movement between regions with similar isotope measures, like sites within the Belize Valley and the northern Yucatan Peninsula (Price et al. 2008), is not visible.

Twenty-four percent of the 62 individuals in the sample were not born near

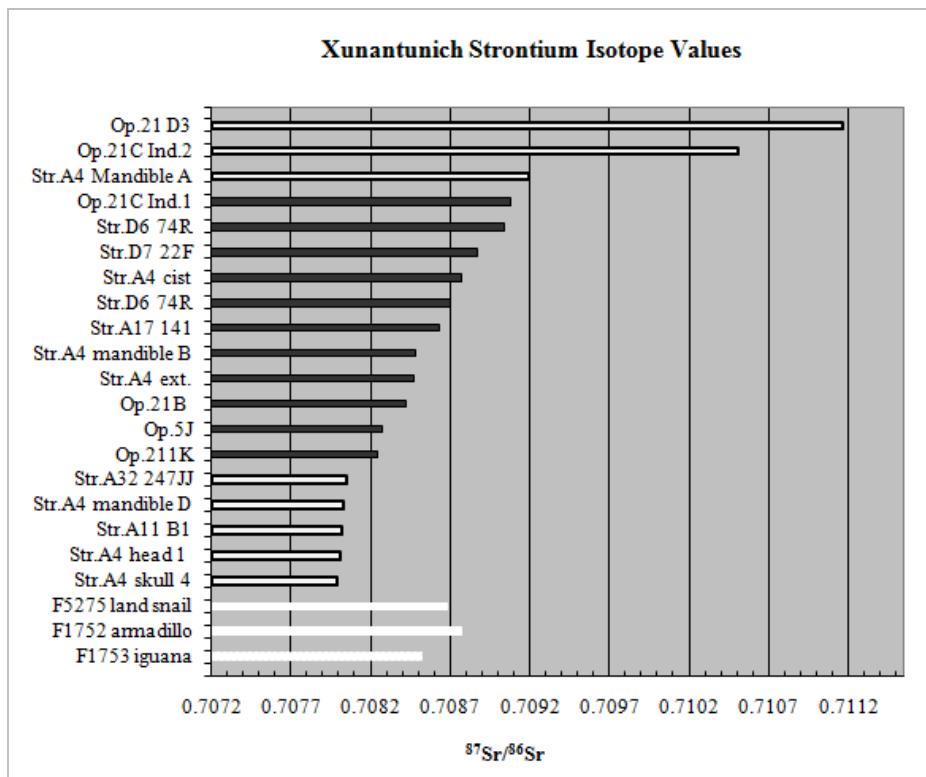


Figure 3. The solid white bars show strontium isotope values of modern fauna sampled near the site. Solid black bars represent individuals with values within Belize River Valley range (.7082 to .7091). Individuals with values outside this range are represented as white bars with black outlines.

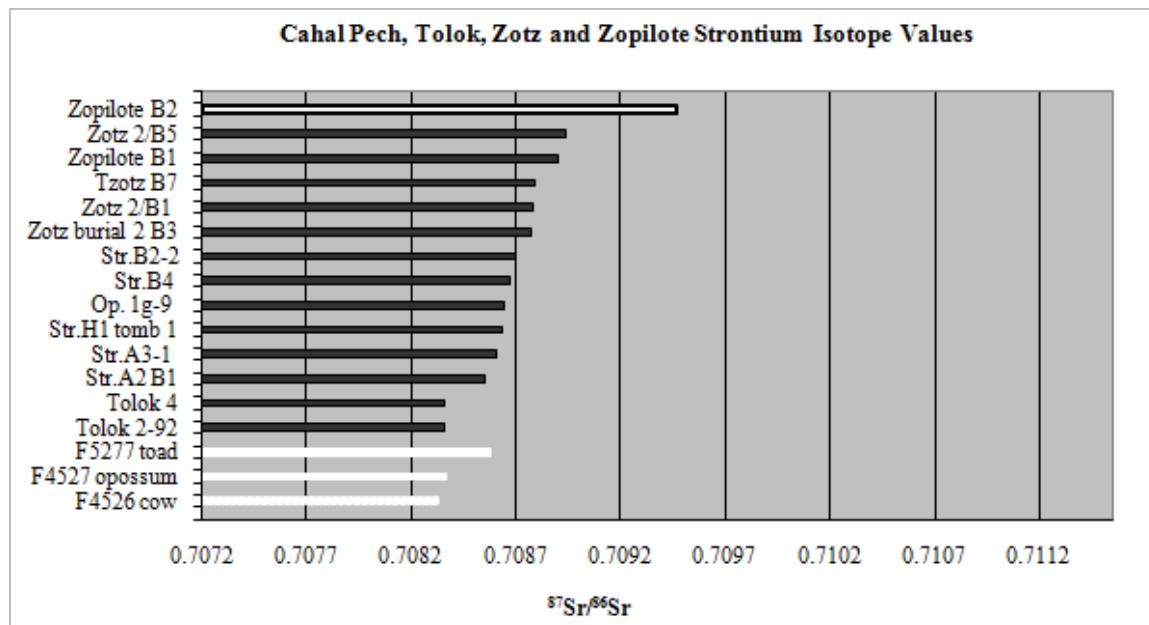


Figure 4. The solid white bars show strontium isotope values of modern fauna sampled near the site. Solid black bars represent individuals with values within Belize River Valley range (.7082 to .7091). Individuals with values outside this range are represented as white bars with black outlines.

site where they were buried. Not surprisingly, the majority of the non-local values are similar to those identified along the Macal River. Other values suggest an origin in or near the Maya Mountains and Central and Southern Lowlands. Some of these values can be found less than 20 kilometers away, but similar lowland values also exist hundreds of kilometers from the valley.

Key aspects of population movement differ at each center. More than 40% of the sample population (n=19) at Xunantunich had a non-local origin, compared to a single individual at Cahal Pech (n=14, but n=20 including Mitchell's 2006 data). Twenty-one percent of the Baking Pot sample (n=28) had non-local values, which reflects patterns for the valley as a whole (Freiwald nd). This includes both local and interregional population movement, and non-local individuals are identified in both residential and monumental burial contexts. Immigration from multiple- but distinct locations - is visible at Baking Pot and Xunantunich. This suggests that, to some extent, that migration patterns reflect the distinct social or political networks of each polity.

Xunantunich

Xunantunich has nearly twice the number of migrants as sites elsewhere in the valley (Freiwald nd). Nearly half of the individuals sampled - 47% - have non-local $^{87}\text{Sr}/^{86}\text{Sr}$ values (Figure 3). Three faunal samples found near the site have an average value of .7086, slightly higher than the average of the baseline samples that define this strontium zone (.7085). Five individuals have lower values lower than that form a distinct group at the site, but are not statistical outliers. Similar values are identified in the Central Petén region. Two of three high values are outliers (more than 1.5 times above the interquartile range, or IQR). These values are only identified near the Macal River and Maya Mountain zones.

Strontium isotope values within the local baseline range also have an average value of .7086. This includes a child interred at the center of one of the site's two ballcourts and several Group D residential burials, including both adults and an infant. One of the Group D burials, a chultun with five interments, also contained two individuals with non-local isotope values that exceed .710. While the norm for Belize Valley burials is a southern orientation and prone, extended body position (Willey et al. 1965; Schwake 2007), these individuals were oriented in east-west directions (Braswell 1995).

Individuals with low, Central Petén-like values also were interred with a non-standard body position and orientation. This includes male adults in palace Str A-11 and Castillo Str. A-32, who both were oriented to the north. Similar values also are identified in an adolescent, a child, and the skull of one adult in a deposit on Str. A-4 (Adams 1998; Audet 2006; Yaeger 2010; Piehl nd). The skull-only interments of two additional adults had a local value and a high one, showing three distinct origins for individuals in a single deposit.

Oxygen isotope values show that the Xunantunich individuals with Central Lowland values shared a similar drinking regime as children, one that differed from residents of the Belize Valley, Caracol, and Mountain Pine Ridge (Freiwald nd). The presence of these individuals is intriguing: their burials are associated with changes in architecture that are interpreted as a shift in political affiliation at the site and connections to Naranjo (Yaeger 2010).

Cahal Pech

All but one of the thirteen individuals (14 samples) have a value that fall within the baseline established for the Belize River (Figure 4), including the six individuals sampled by Mitchell (2006). The average value (.7087) is higher than the fauna sampled near the site (.7084). Though five burials pre-dating the Late Classic make the sample more variable temporally, the range

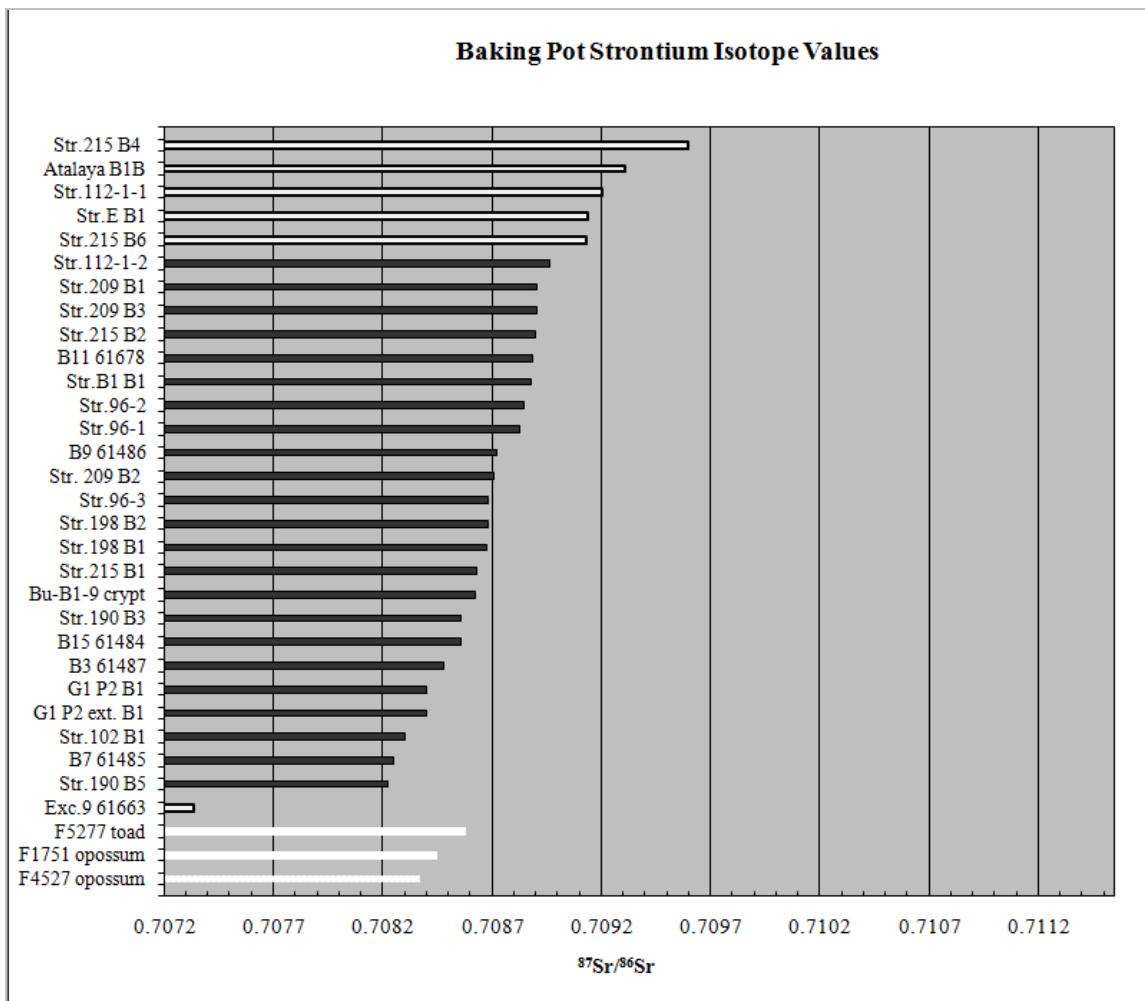


Figure 5. The solid white bars show strontium isotope values of modern fauna sampled near the site. Solid black bars represent individuals with values within Belize River Valley range (.7082 to .7091). Individuals with values outside this range are represented as white bars with black outlines.

of values is smaller than that of Xunantunich local values.

The single non-local value matches those identified along the Macal River; that is, just a few kilometers upstream from the location of Cahal Pech. This high value is identified in the cranium of a young adult male included in the burial of another young adult male in the terminus structure at Zopilote, a non-residential group identified as a shrine. In contrast, local values are identified in the six individuals sampled from the residential shrines at Tolok and Zotz. Originally constructed as circular platforms, they were used repeatedly for centuries (Aimers et al. 2000; Awe et al.

2009; Healy et al. 2004; Powis and Hohman 1994). Other individuals with local values were buried in richly-appointed tombs and a triadic eastern shrine (Mitchell 2006).

While only a single atypical burial contains a non-local value, and no inter-regional migration is identified, it is important to note that these results do not demonstrate a lack of population movement at Cahal Pech. Any relocation from within the valley, or from regions with similar strontium isotope values, is not visible. This includes individuals from the northern Yucatan, whose influence is suggested during the Terminal Classic (Aimers et al. 2000).

Baking Pot

Results from Baking Pot differ from both Xunantunich and Cahal Pech, but represent migration patterns for the valley as a whole (Freiwald nd). Six of the 28 individuals (29 samples) in the study, or 21.4%, have values higher or lower than those identified along the Belize River (Figure 5). Like Cahal Pech, locally-defined values are on average higher (.7087) than the three closest baseline values (.7084). Three burials predate the Late Classic, and a date has not yet been determined for the ten burials excavated by Ricketson.

The values of two individuals are statistical outliers from the IQR. One has a low value that indicates an origin in the Southern Lowlands. Unfortunately, no information is available on the burial context or location, though it is associated with Ricketson's excavations. The other outlier is one of three individuals with high values like those identified near the Macal River, or perhaps the vicinity of the Maya Mountains.

Individuals with local values include those associated with imported burial goods in terminus structures. While these non-local grave goods indicate long distance interaction (Audet and Awe 2005), none of the individuals in Strs. 209 and 190 have measurable non-local strontium isotope values. Individuals buried in Strs. B (A1) and E (A5) also have burial goods with origins that differ from those suggested by the associated isotope values. Other local values are identified in all but one individual from Ricketson's 1929 excavations in Group G (Str. A17).

Most of the non-local values were identified in residential plazuela groups. Burials in Strs. 215 and 112, and in the Atayala group, each contained individuals with isotope values suggesting an origin in the Macal River region. These individuals were buried in the typical Belize Valley pattern, with a southern orientation and in a prone position, similar to interments with local values in the groups.

Patterns of Population Movement at Xunantunich, Cahal Pech, and Baking Pot

The first goal of this paper was to present new $^{87}\text{Sr}/^{86}\text{Sr}$ baseline values, and show that detailed maps of biologically-available strontium isotope values are useful for identifying both local and interregional population movement. This level of isotopic variability is not visible in geologic maps (e.g., Cornec 2008). The heterogeneous geology and intensive sampling result in identification of more migration than in many published studies. However, even the high rate of population movement at Xunantunich may be underestimated since movement between regions with similar values is not discernible.

The second goal was to compare migration patterns at three sites, and several patterns are visible. First, migration patterns at each site show movement within the Belize Valley, but differences in interregional connections. It is possible that these reflect sociopolitical connections of individuals at each site; however, non-local burial goods would not have been useful indicators of origin in this sample. A better indicator of migration from another region is burial orientation, body position, and/or skeletal completeness.

In-migration also was visible in diverse burial contexts, including households and monumental architecture. This includes male, female, and juvenile migrants; demographic trends are analyzed only as part of the larger study (Freiwald nd), but it is clear that population movement was common and crosscut all sectors of society. The impact of this ongoing population movement would have been great, as migration has enormous cultural implications for the migrants, the communities they join, and the ones they leave behind (Koji 2000).

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8 **POWER AND STATUS IN CENTRAL BELIZE: INSIGHTS FROM THE CAVES BRANCH ARCHAEOLOGICAL SURVEY PROJECT'S 2010 FIELD SEASON**

Christopher R. Andres, Gabriel D. Wrobel, Jason J. Gonzalez, Shawn G. Morton, and Rebecca Shelton

In 2009, the Caves Branch Archaeological Survey (CBAS) undertook its initial season of investigations in central Belize. In this paper, we report on the most recent insights into socio-political interactions between sites in the Caves Branch and Roaring Creek drainages gained in 2010. Our most recent research has focused on the newly documented major civic-ceremonial center of Tipan Chen Uitz, which we speculate was the central focus of a regional political hierarchy during the Late Classic period (A.D. 600-800). Tipan and its network of surrounding sites provide a valuable frame of reference to evaluate the possibility that changes in power and status in this area of Belize reflect the rise of “new” centers in association with the breakdown of polities in the Maya heartland during the Late-to-Terminal Classic period. In this paper, we approach these issues from the perspective of integrated settlement, site center, and subterranean data sets.

Introduction

In 2009, the Caves Branch Archaeological Survey (CBAS) Project began investigating ancient Maya population dynamics in the Caves Branch River Valley (Andres and Wrobel 2010; Wrobel et al. 2010a). During the 2010 field season, we sought to better define regionally specific pre-Hispanic cultural patterns by expanding our investigations into the “Roaring Creek Works” – the zone between the Caves Branch and Roaring Creek drainages in central Belize (Figure 1).

Following patterns initially established by the Belize Valley Archaeological Reconnaissance (BVAR) project, our research draws on multiple data sets and site types in an effort to achieve a holistic reconstruction of ancient Maya communities in this part of Belize. In 2010, our research focused on: (1) identifying and mapping settlement, administrative, and ritual contexts; (2) sub-surface investigations examining constructed and symbolically-important natural features; and (3) analysis and comparison of the resulting data sets.

The regional approach pursued by members of the CBAS Project assumes that individual sites cannot be adequately understood if viewed as unrelated entities. The data sets we are currently collecting are therefore not only overlapping, but derived from multiple locations. The settlement,

speleoarchaeological, and architectural investigations conducted in 2010 primarily focused on three archaeological sites: the newly reported civic-ceremonial center of Tipan Chen Uitz (Andres et al. 2010), the mortuary cave site of *Je’reftheel* (Helmke 2009; Wrobel and Ebeling 2010), and Sapodilla Rockshelter. In addition to enhancing our understanding of regionally specific developments, we believe that our research has important implications for issues of power and status in this part of the Maya Lowlands. It is these patterns that are highlighted in the following discussion.

Site Center Investigations at Tipan Chen Uitz

The site of Tipan Chen Uitz (“Fortress Mountain Well” in Yukatek) rests on a series of karstic outcrops between the previously investigated centers of Cahal Uitz Na and Deep Valley (see Figure 1) (Andres et al. 2010). While initial observations indicated that Tipan was large, our recent excavations and Jason J. González’s detailed topographic mapping have further illuminated Tipan’s impressive qualities (Figure 2). These include: the site center’s areal coverage, energy invested in the acropolis, building sizes, architectural heterogeneity, and courtyard counts. To this extent, the site center covers approximately 50,000 square meters; contains a massive

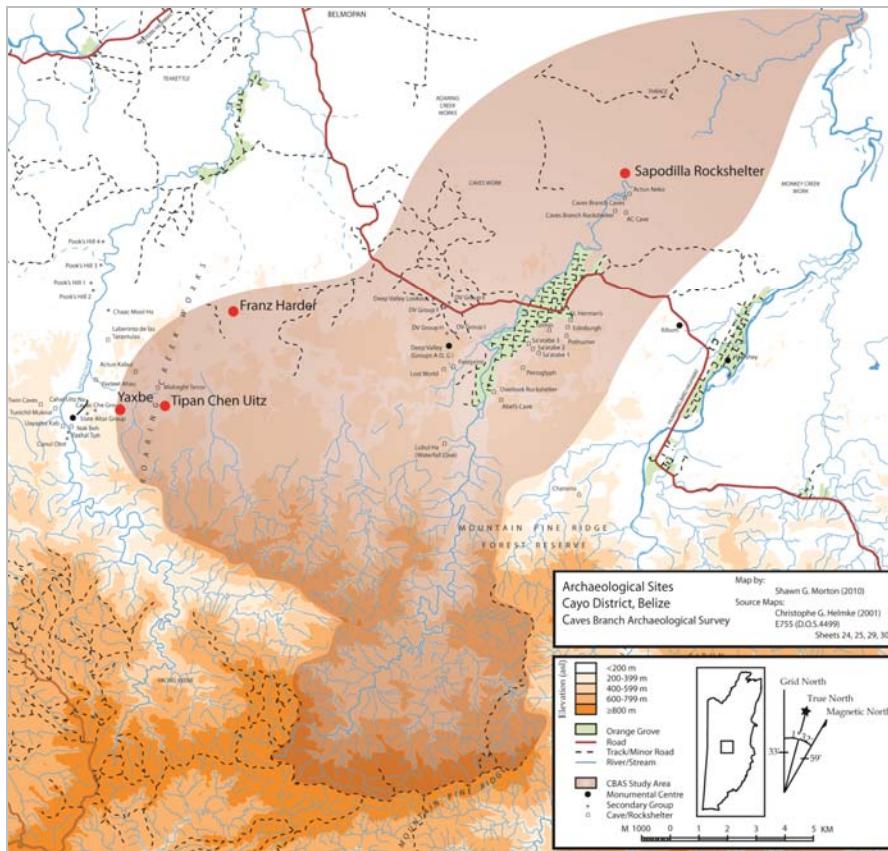


Figure 1. Map of sites in the Caves Branch area referred to in the text (map by Jason J. González and Shawn G. Morton).

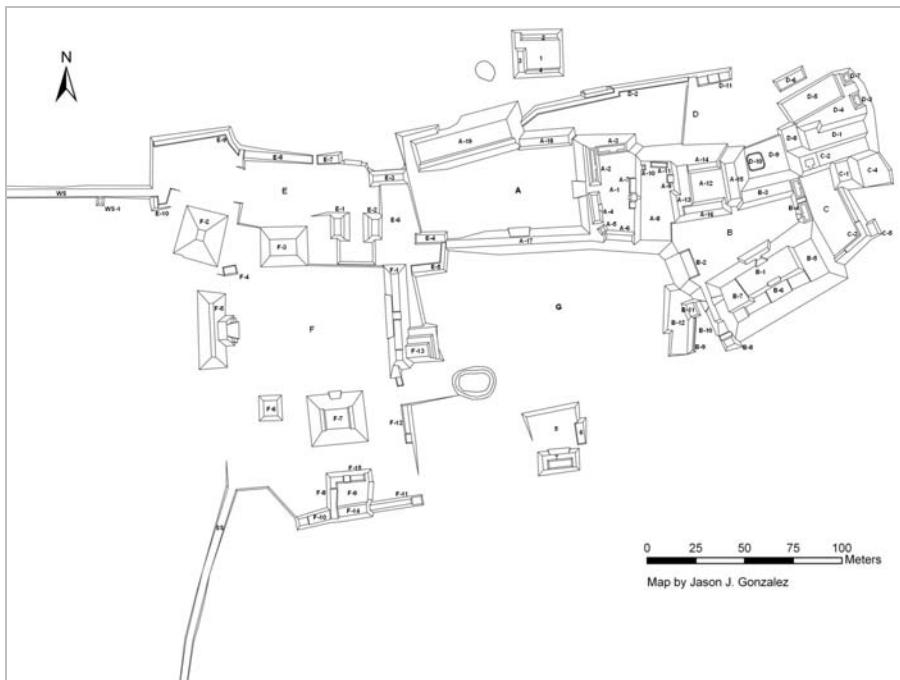


Figure 2. Map of Tipan Chen Uitz (map by Jason J. González).

palace complex, several temple structures, a ballcourt, extensive range structures, and two *sacbeob*; has buildings measuring more than 20 m in height; and consists of at least 11 courtyards and plazas. Based on these elements, it is reasonable to suggest that Tipan occupied the top of a regional political hierarchy and that it is most appropriately viewed as a “primary” civic-ceremonial center (Andres et al. 2010).

Research at Tipan in 2010 concentrated on mapping and chronological assessment of the site center architecture. Due to the presence of a number of large looters’ trenches, most of our excavations served to collect data from buildings damaged by looting activity. Work in Plaza A provides testimony to the ability of the community’s leaders to mobilize tremendous amounts of labor. Here, a looters’ pit revealed that the plaza’s east end was raised 3 m with dry-laid boulder core. This single-phase construction reflects an impressive effort to dramatically re-shape the natural topography and suggests that much of Tipan was constructed rapidly.

Our investigations also provided preliminary insights into the site’s chronology. The presence of early construction is possible since we have yet to undertake deep excavations through intact architecture. However, with the exception of a single complex deposit (discussed in detail below), our current data suggest that the community was constructed late and was occupied relatively briefly. Looters’ trenches in Str. A-1 have revealed a platform that was remodeled at least once and was accessed by way of a single-phase Late Classic stairway (see Figure 1). The latest modifications to Str. A-1, which appear to be Terminal Classic in origin, include a secondary platform composed of massive, vertically-set facing stones. This construction, which may have incorporated multiple uncarved stelae, extended the building westward into the plaza (Figure 3). The final phases of several other buildings, including Structures C-1, F-3, F-6, and F-7 show suspiciously little evidence of finished architecture or soil development. These



Figure 3. Photograph of probable Terminal Classic period construction incorporating massive, stelae-like slabs at the western base of Structure A-1, Tipan Chen Uitz, Belize (photograph by Christopher R. Andres).

structures consist of little more than massive piles of loose boulder core and may also be Terminal Classic. Their appearance raises the possibility that they may have been abandoned prior to completion.

Tipan’s potentially shallow time depth and limited evidence of architectural accretion makes it an excellent location to consider links between community planning and the political ambitions of the community’s leaders. To this extent, Tipan seems to stand in contrast to longer-inhabited centers, which as David Webster (1998:18) has noted are difficult to assess because they are “not designed systems of architecture so much as historical accretions, with all the noise and sloppiness that characterize evolved, as opposed to engineered, systems.”

Maya site layouts are often asserted to reflect cosmological principles, which in turn are suggested to have significant implications for power and status. Tipan clearly incorporated cosmologically important elements, such as caves, as discussed below. However, the site is interesting because its form does not invoke obvious Petén-inspired architectural templates, such as those discussed by Ashmore and others (e.g., Ashmore 1989, 1991, 1992; Ashmore and Sabloff 2002, 2003; Smith 2003). Rather, the site’s layout appears to be more a function of its location. In this sense, Tipan’s founders seem to have

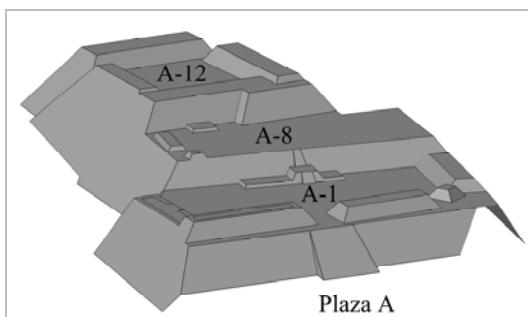


Figure 4. Isometric reconstruction of the Group A acropolis at Tipan showing its elevation and enclosure of its constituent spaces (reconstruction by Jason J. González).

pragmatically selected a setting that facilitated control of access to symbolically-important pre-existing landscape features and to the architectural spaces that they rapidly constructed.

Our investigations suggest that Tipan's builders capitalized on the many "haystack" hills found in the area, founding the site center on naturally elevated terrain, glimpses of which are evident as bedrock outcrops in the site's central plazas. We also suspect that several of Tipan's most prominent architectural features, including the massive Group A and B-1 eastern acropoli, contain hills (see Figure 2). This practice of remodeling natural features into platforms that appeared artificial was not only energetically efficient, but would have increased the speed with which the community could have been constructed.

The constructed spaces to which pre-existing landscape features lent themselves were clearly central to the agendas of Tipan's elites in emphasizing architectural height and restricted access to space. When approached from low-lying surrounding areas, the verticality of Tipan's central precinct is particularly impressive. During our recent investigations, we have also been struck by the enclosed nature of many of the community's architectural groups. Following patterns highlighted by Jaime Awe at Cahal Pech and other locations (Awe 2008; Awe et al. 1991), the natural terrain was re-sculpted to create a series of highly-elevated, spatially restricted, and presumably increasingly exclusive spaces.

This tendency is most apparent in the site's eastern sector. The Eastern Acropolis, which we interpret as the community's paramount elite residence or "palace" complex, consists of an assemblage of stacked spaces that decrease in size as they increase in elevation and degree of privacy emphasized by the presence of a nearby 4-m-deep, plaster-floored cistern, capable of holding at least 60,000 gallons of water. Based on its proximity to the palace, this may have functioned as a private water supply (see Figure 2).

A final element of Tipan's layout that may have broader access-related implications is the presence of possible fortifications. The distinction between barriers that enforced internal social divisions and those that may have served defensive purposes can be difficult to discern. However, our examination of one of these parapet-like features along the northern edge of Plaza D proved provocative (see Figure 2). When considered in combination with the site's elevated setting, placement of large range structures around plaza margins, limited numbers of accessways, and the positioning of structures on cliff tops, it seems likely that Tipan reflects security-related concerns (Andres et al. 2010). These qualities could indicate that Tipan's founders were non-locals who perhaps inserted themselves into a hostile political landscape, though this is speculative at this point in our investigations.

Tipan also includes two causeways. The first of these leads south and ends in an area of jagged karst. In contrast to nearby Cahal Uitz Na, whose southern *sacbe* leads to a cave (Awe and Helmke 1998), Tipan's terminates at what may have been a quarry. While reconnaissance identified several deep sinkholes, we have yet to find any outhernly-located caves with significant cultural deposits. At this time, Midnight Terror Cave, located about 600 m to the northwest still appears to be the nearest focus of public ritual cave activity (e.g., Brady 2009).

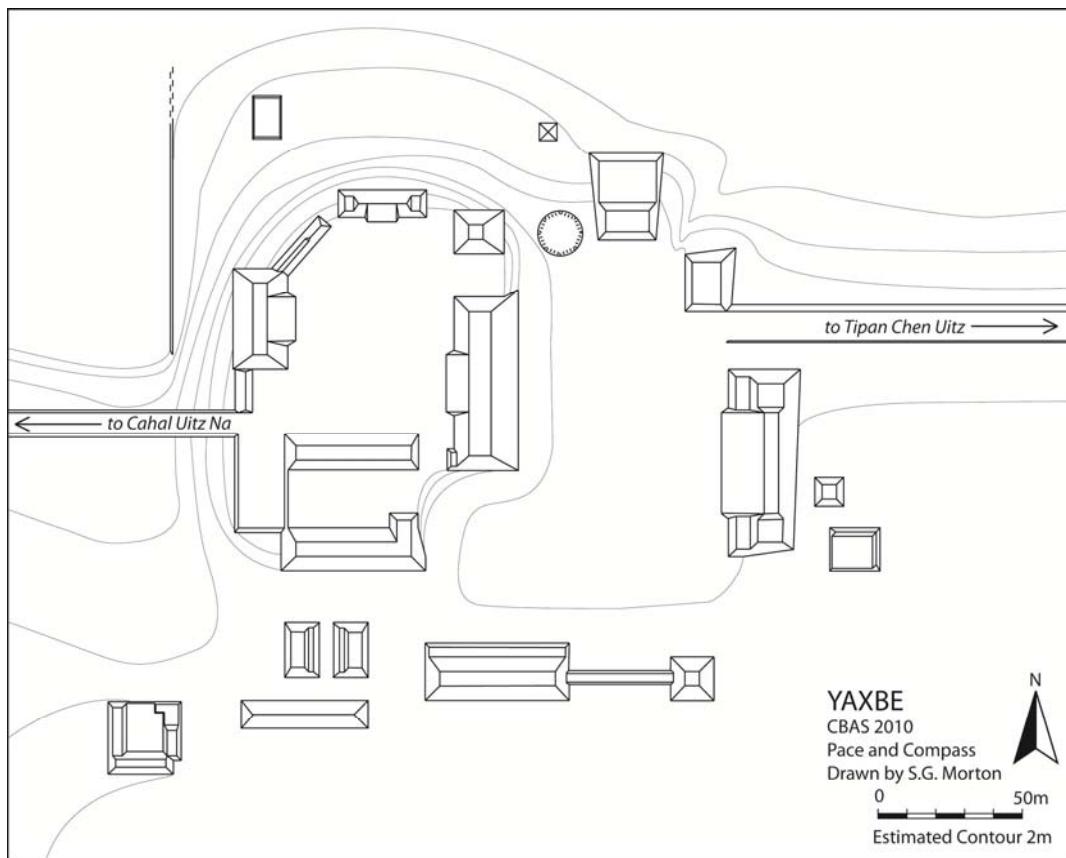


Figure 5. Pace and compass map of the newly discovered minor center of Yaxbe (map by Shawn G. Morton).



Figure 6. Map of TCU s.08 (map by Shawn G. Morton).

The second *sacbe* at Tipan leads to the west and provides an excellent segue into our emerging understanding of supra-site level sociopolitical organization. In 2010, we followed this *sacbe* and discovered that it leads to a secondary center located approximately 1.5 km to the west (see

Figure 1). This center, for which we have suggested the name of Yaxbe (“Green Road,” so named in reference to the now forested roads by which it is approached), has a monumental precinct that includes multiple pyramids; several large range structures; a Tipan-style masonry cistern;

and a ballcourt (Figure 5). We also discovered that a causeway continues west from Yaxbe, descends the escarpment into the Roaring Creek Valley, and continues all the way to Cahal Uitz Na. This direct physical connection between what we interpret as “primary” and “secondary” centers suggests a significant degree of social, political, and economic integration.

Subterranean Features in the Tipan Site Center

Preliminary reconnaissance conducted at Tipan in 2009 located 21 caves, sinkholes, and rockshelters, 16 of which contained surface artifact scatters. An additional three were considered to have significant archaeological potential based on their proximity to monumental architecture. Of these, two (TCU s.21 and TCU s.08) were investigated in 2010. As much research in the 1980s and 1990s focused on large, easily accessible caves in the Caves Branch and Roaring Creek drainages, investigations of these smaller features, which are closely associated with monumental architecture, are important in broadening our regional understanding of cave use.

TCU s.08 is of particular interest to the discussion at hand. Consisting of a solution hole in the bedrock underlying Plaza C, this cave appears to have been sealed in antiquity by a half meter of fill and later exposed by a looters’ pit (see Figure 2 and Figure 6). Development of a significant humic layer under the exposed entrance suggests that the feature has been open for some time. An abundance of ceramics led us to initially interpret the feature as a dedicatory cache deposited prior to construction of the overlying plaza. Given the well-documented ritual integration of subterranean sites in rites of accession, aggrandizement, social incorporation, and boundary maintenance, we viewed this feature as an important location for investigating the socio-political affiliations of Tipan’s founders, as well as for establishing a base-line date for use of the area.

Excavation of TCU s.08 revealed a deposit of immense richness: more than a metric ton of material was collected during our excavations. The deposit consisted almost entirely of ceramics and is dominated by coarse storage vessels, with a low percentage of the assemblage represented by bowls, dishes, and other specialized forms. With the exception of a miniature, intact Cocay Appliquéd jar (Proto/Early Classic) found in the deepest strata of the excavation, the deposit was initially thought to date exclusively to the Late-to-Terminal Classic. However, subsequent ceramic analysis raises the possibility of a more extended period of use. While the majority of materials are unquestionably Late-to-Terminal Classic (Spanish Lookout Complex: Roaring Creek Red, Xunantunich Black-on-orange, Benque Viejo Polychrome, and Cayo Unslipped, among others), limited numbers of sherds mixed throughout date to as early as the Protoclassic (Floral Park Complex: possible examples of Monkey Falls Striated and Negroman Punctated-incised: Negroman Variety) and span the Early (Hermitage Complex: Minanha Red) and Late (Tiger Run Complex: Macal Orange-red and a number of buff or cream polychromes) Classic.

Intriguingly, a variety of factors suggest that the feature and deposit were ritual in nature. Excavations revealed that the cave was modified in antiquity, with stalactites being clipped to afford greater interior space, and rubble used to raise the floor. This rubble was removed during excavations since it had clearly been artificially introduced. As noted above, a whole, miniature Cocay Appliquéd jar (Figure 7) was found beneath this fill and a C-14 sample produced a calibrated date of 1810-1560 ybp (140-390 CE). The presence of the Cocay Appliquéd jar is particularly significant because such vessels are almost exclusively associated with Protoclassic-to-Early Classic period cave assemblages (Reents 1980; Peterson 2006). The overall

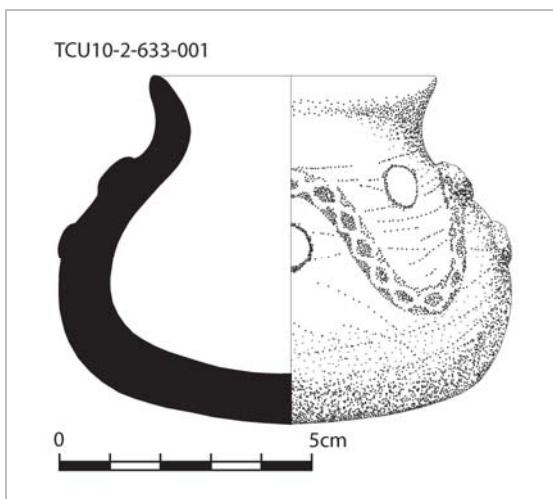


Figure 7. Cocay Appliquéd jar from TCU s.08 (drawing by Shawn G. Morton).

deposit is also consistent with Late-to-Terminal Classic period cave assemblages in the region (Petroglyph Cave, Reents 1980; Overlook Rockshelter, Wrobel et al. 2010b; Actun Lubul Ha, Morton 2010; see also, Hardy 2009; Wrobel et al. 2007, 2009). Resemblances include the ratio of plainware vessels to fragmented and partial polychromes, the presence of shoe pots, and jars with kill holes. Why such a deposit would be found in the monumental core is somewhat uncertain and it has a number of ambiguous qualities. On one hand, the presence of materials spanning a millennium suggests that the feature was open for an extended period. At the same time, architectural evidence from the surrounding plaza suggests that it was almost certainly sealed beneath architecture for at least some amount of time. Ultimately, the deposit is noteworthy for its size, richness, and the fact that it has produced far earlier ceramics than have been recovered elsewhere at Tipan to date.

Recent Research at Outlying Subterranean Sites

In the northern portion of the Caves Branch Valley, we undertook preliminary investigations at the recently discovered and heavily looted Sapodilla Rockshelter (see Figure 1). This site provides further evidence for regional variation in cave use,

including temporal data useful in reconstructing the timing and extent of settlement in the region. Our work here in 2010 focused exclusively on mapping the site and screening looters' spoil (Figure 8).

Fortunately, despite the site's devastated appearance, looters had only penetrated archaeological deposits deeply enough to disturb primary burials in three areas. Investigations furthermore revealed that the site is noteworthy in that the density and size of recovered bone fragments are consistent with the general matrix at the nearby Caves Branch Rockshelter (Wrobel et al. 2007). This is significant because it suggests that Sapodilla Rockshelter possessed a similar cemetery function, and contains numerous intrusive interments as well as disturbed primary burials.

Despite its functional similarity and proximity to the Caves Branch Rockshelter (which lies approximately 1.5 km away), our investigations also highlighted important differences between the two locations. Perhaps most intriguing is that the ceramic assemblage at Sapodilla is primarily limited to the Protoclassic and Early Classic periods, as opposed to spanning the Middle Preclassic through Terminal Classic as at the Caves Branch Rockshelter. Based on the ceramics, we strongly suspect that the burials at Sapodilla are similarly limited to this earlier and more temporally restricted interval. Sapodilla is also distinguished by the fact that it perhaps appears to have experienced a broader range of uses judging by the presence of lithic debitage, which appears more prevalent than at the Caves Branch Rockshelter. Finally, our preliminary analysis of ceramics tentatively suggests that earlier use of Sapodilla Rockshelter was focused in the light zone, whereas later activities also incorporated the dark zone.

In addition to the many other cave and rockshelter sites that have produced substantial amounts of early ceramics in the Caves Branch River Valley (Hardy 2009; Graham et al. 1980), both the Caves Branch Rockshelter and Overlook Rockshelter are associated with Early Classic human burials

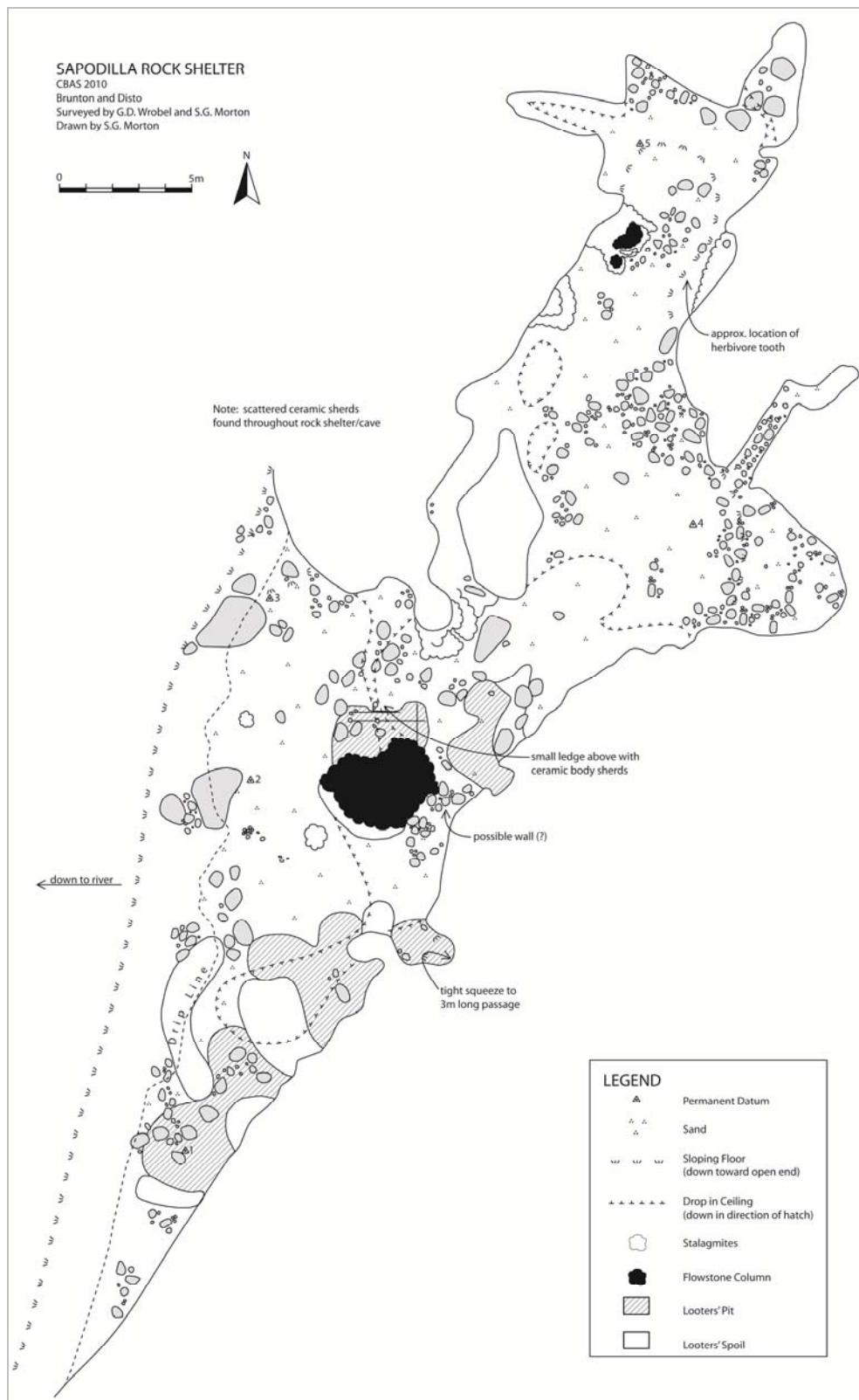


Figure 8. Map of Sapodilla Rockshelter (map by Shawn G. Morton and Gabriel D. Wrobel).

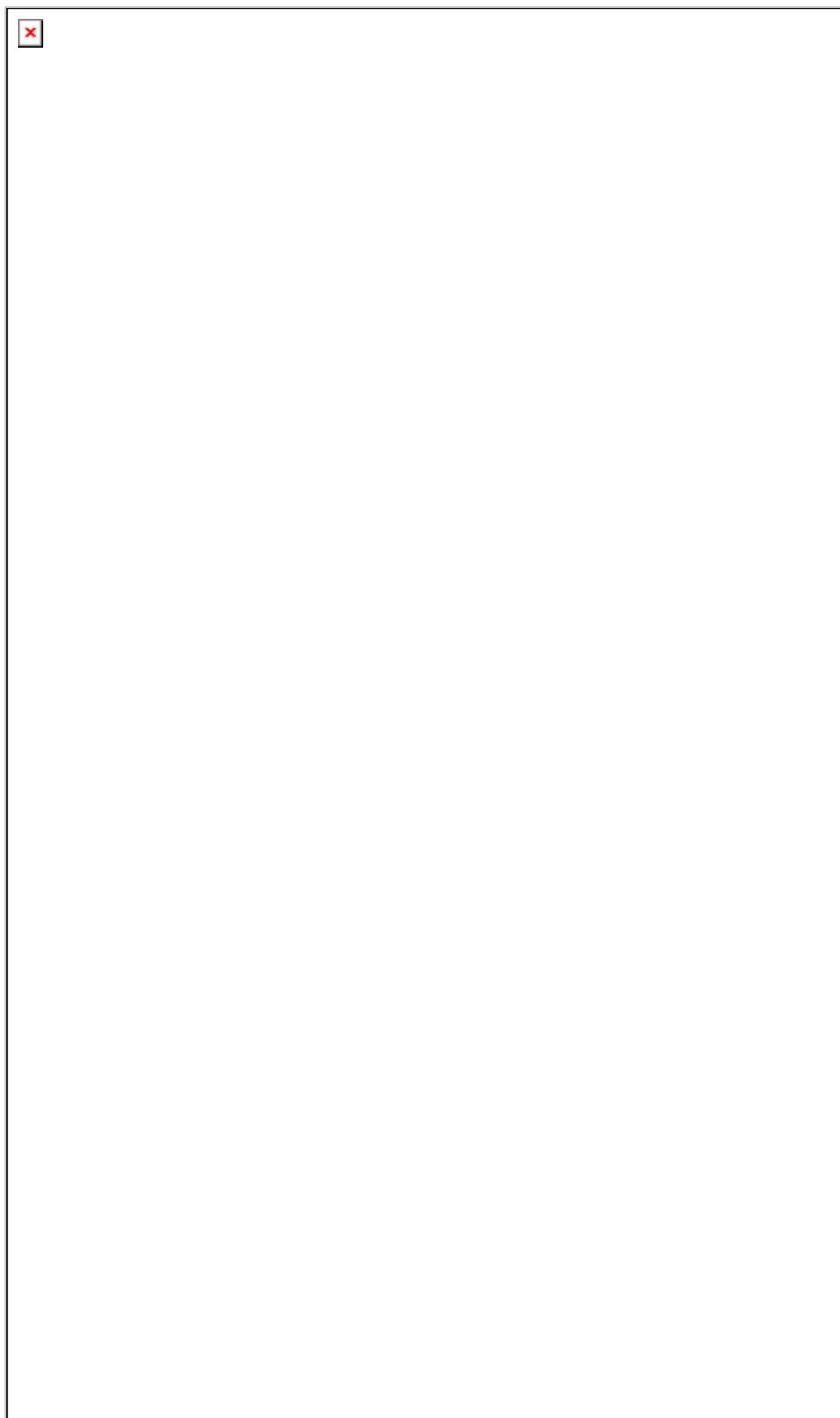


Figure 9. Map of *Je'reftheel* showing the location of Feature 5 in Chamber 3 (map by Christophe G. Helmke).

(Wrobel et al. 2007, 2010b). When considered together, these data suggest a level and diversity of activity that are inconsistent with suggestions that early ritual cave activity in the area reflects pilgrimage from surrounding areas (McAnany et al. 2004). The perspective emerging from Sapodilla Rockshelter therefore supplements a growing body of data from subterranean sites suggesting the presence of local residential populations prior to the establishment of the monumental centers of Tipan, Deep Valley, and Yaxbe (Andres et al. 2010; Wrobel et al. 2010a).

In 2010, extensive investigations also continued at *Je'reftheel* (aka, Franz Harder Cave) (see Figure 1). This site, which lies in Springfield Village approximately 4.5 km from the Tipan site center, speaks to the nature of possible late intrusions – particularly the establishment of new elite groups in the region. Our most recent work at *Je'reftheel* included mapping the human skeletal material present in Feature 5 within Chamber 3 (Figure 9).

A preliminary analysis of the bones identified nine individuals of different ages and sexes, bringing the total number of individuals in the cave to approximately 20-25. Most of the burials were primary, though they were placed sequentially, as was also the case with previously investigated Feature 7 (Wrobel and Ebeling 2010; Wrobel et al. 2010a). Earlier interments were partially displaced by later ones, demonstrating that the space was revisited and reused--however, apparently for only a short time. Helmke's (2009) analysis demonstrates that all ceramics in the cave, and thus presumably all the features, are roughly contemporaneous, and he estimates that they date to within the same century or century and a half during the Late Classic. An AMS date based on charcoal samples collected by Helmke from Chamber 3 dates activity to A.D. 680 to 890 (2-sigma). Thus, it appears that the use of *Je'reftheel* generally coincides with our current estimate of Tipan's founding and establishment of more complex sociopolitical hierarchies in the region.

Given the ideological parallels between tombs and caves (Brady 2001:298; Schele and Freidel 1990:71-72), as well as the mortuary similarities between *Je'reftheel* and many tombs (Wrobel et al. 2010a), we believe that this cave functioned as a tomb. In addition to the clear pattern of reuse, this hypothesis is supported by the presence of grave furnishings, which in the literature are generally presumed *not* to be included with sacrificial victims (Brady 1989:362-363).

Grave furnishings present in Feature 5 included jadeite and limestone earspools, a small Tinaja Red *olla*, chert bifaces, and small beads. A number of perforated *olivella* shells were also found, several of which formed a bracelet placed on an articulated wrist. Such ornaments were not limited to a single individual in *Je'reftheel* as indicated by Helmke's earlier report of another cluster near a pelvis. In this particular case, the shells' location led Helmke (2009:446) to surmise that they formed part of a belt.

The physical qualities of *Je'reftheel* are also useful when contemplating its function. To this extent, the cave's small, restrictive nature does not appear to have lent itself to public ritual. The possibility that *Je'reftheel* served as a corporate group burial site contributes to our developing understanding of power and status in the Caves Branch region on several fronts. As commonly noted in Maya cave studies, appropriation of subterranean contexts seems to have conveyed strong status-related messages based on ideological links between caves and creation, fertility, and sustenance. Furthermore, ethnohistoric and ethnographic accounts demonstrate that cave rituals are often important means of tying individuals or corporate groups to land. Thus, one possible explanation for the placement of clusters of related individuals in caves and rockshelters around the periphery of our study area is as a means of marking boundaries and establishing territorial claims by newly arrived groups.

Summary and Conclusions

As detailed in this paper, investigations of central Tipan and outlying cave and rockshelter contexts undertaken by the Caves Branch Archaeological Survey in 2010 provide significant insight into the foundations of what Eric Wolf has termed “organizational power,” or the ability of certain social components to influence the actions of others by organizing settings and environments of daily practice (1990:586). Nevertheless, despite the strides we have made in understanding these issues in the Caves Branch area to date, we fully appreciate that power and status are complex constructs that often involve significant amounts of negotiation, and that cannot be viewed merely in terms of top-down influence (e.g., Scott 1990). The settlement pattern work we plan to undertake in future seasons will be critical in beginning to illuminate the other side of this dynamic. Expansion of research beyond Tipan’s core will not only provide insight into the distribution of Early Classic populations in the Caves Branch area, but will allow us to evaluate the likelihood that significant residential populations were present before the appearance of the region’s larger, more archaeologically-visible, Late Classic period centers.

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9 REVISITING THE KINGDOM OF THE CRYSTAL SKULL: NEW INVESTIGATIONS AT LUBAANTUN

Geoffrey E. Braswell, Nancy Peniche May, Megan R. Pitcavage, and Kiri L. Hagerman

Since 2009, the members of the Toledo Regional Interaction Project have conducted archaeological excavations at the Late to Terminal Classic Maya site of Lubaantun, Toledo District, Belize. Excavations have been conducted in four structures in the site center. These include two that form a single house platform (Str. 51/52), a second elite house (Str. 45), and a temple (Str. 34). This report describes these excavations as well as the construction sequences of these important buildings.

Introduction

Intermediate scales of archaeological analysis are often neglected. In the Maya area, we tend to concentrate on the household, site, or small polity (what might be called the local scale) or, conversely, on studies of interregional or even long-distance interaction (what might be called the macroscale). Regional patterns of political and economic organization, especially the relationships between distinct polities within a relatively small area, often receive less attention, except within the field of epigraphic studies.

Richard Leventhal (1991) describes inland Toledo District, Belize, as an archaeological region (Figure 1). The purpose of his definition is to move archaeologists away from the culture area concept (i.e., a macroscale perspective) and to refocus attention on the intermediate regional level. His approach echoes models of regional states proposed by Joyce Marcus (1976), R.E.W. Adams and Richard Jones (1981), but Leventhal emphasizes shared patterns of material culture rather than political organization. For Leventhal, the geographical boundaries of the Southern Belize Region are the Maya Mountains to the north and west, the swamps and rivers to the south, and the Caribbean to the east. Many of the material culture traits that he sees as defining the Southern Belize Region are architectural in nature. These include the construction of: (1) ballcourts with walled enclosures; (2) platforms without stone superstructures; (3) tombs lacking vaults; and (4) pyramids integrated with the



Figure 1. The Southern Belize Region.

natural terrain in the manner of “Hollywood sets.” Other important characteristics shared by most of the sites in the Southern Belize Region include the sequential re-use of tombs and the erection of carved monuments with erroneous Lunar Series data. Leventhal (1991) justifies the definition of the Southern Belize region by demonstrating that many of these traits are more common at sites within Toledo District than without it, that is, by arguing that the Southern Belize Region as a whole exhibits a degree of homogeneity and, at the same time, is culturally distinct from other regions in the Maya lowlands. J. Jefferson MacKinnon (1991), however, argues that some of the architectural traits used to define the Southern Belize Region are found elsewhere and are not all shared by all the sites in Toledo District.

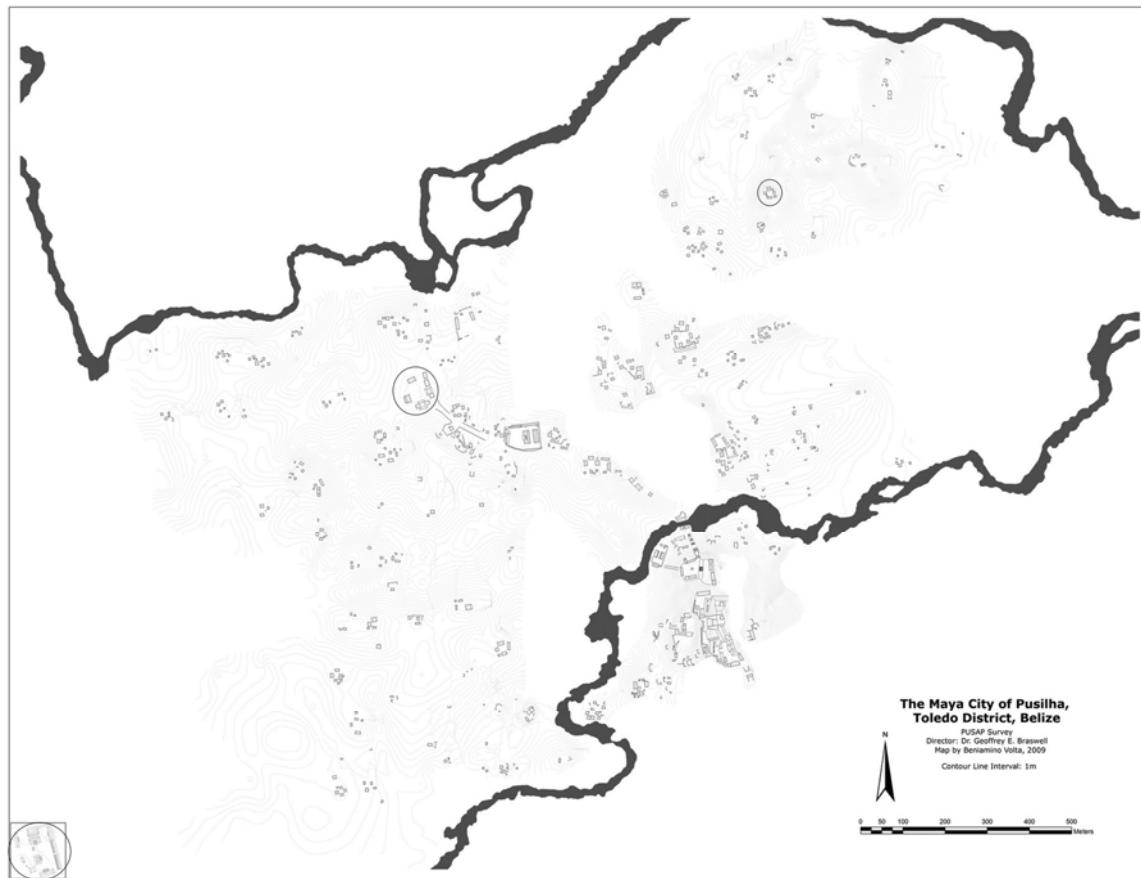


Figure 2. Map of Pusilha and “Special Function Groups.”

Archaeological regions such as that proposed by Leventhal allow us to consider forms of cultural integration at an intermediate scale, but like macroscale culture areas, they are essentially static rather than dynamic constructs. When immigrants settle in a previously uninhabited area, does a culturally cohesive region form because of an already shared history and identity? Or can the emergence of regional cohesion be the result of people with divergent backgrounds adapting to a shared environment? Finally, is the convergence of cultural patterns a reflection of interaction among neighbors, that is, the result of a shared historical trajectory that may include membership in the same regional polity, participation in the same market system, and the formation of a new identity based on geography? Identifying the particular forces and historical processes

that lead to the formation of an archaeological region is ultimately of more anthropological interest than cataloging the traits that define it.

In 2009, we began the Toledo Regional Interaction Project (TRIP) with the goals of: (1) understanding political relations between three of the five major sites in the Southern Belize Region; (2) identifying economic interaction among these three sites; (3) finding similarities and differences in exchange relations with more distant sites and regions; and (4) determining the historical trajectories of each small polity. We envision our work as consisting of three sub-projects: TRIP-L, which has conducted two field seasons of excavations at Lubaantun; TRIP-N, which began a test-pitting program in 2010 at Nim li Punit; and TRIP-P, which in future years will build upon six field-seasons of research at Pusilha

(Braswell et al. 2004, 2005, 2008; Pitcavage and Braswell 2010). Our work complements current investigations conducted by our colleagues at Uxbenka (Prufer 2005; Prufer et al. 2006, 2008). We hope that between our two projects we will be able to form a comprehensive and processual model of the how inland Toledo District functioned as a region.

After just two field-seasons at Lubaantun and a short season at Nim li Punit, our work is not yet sufficiently advanced to answer the questions that motivate our project. Our goals in this presentation, therefore, are to discuss unique aspects of site planning principles at Lubaantun, and describe our excavations of four structures during 2009 and 2010. We consolidated all four of these structures.

Site Planning at Lubaantun

Despite important similarities between Uxbenka and Nim li Punit, MacKinnon (1991) points out that the site planning principles of the major centers of the Southern Belize Region are remarkably different. The major architecture of Pusilha, for example, is built along a northwest to southeast axis, and several of the most imposing groups share a unique orientation and plan. We call these “Special Function Groups” (Figure 2). As at many other Classic Maya sites, the direction north is associated with the heavens, ancestor worship, and the sun at noon. In contrast, ballcourts are found at low elevations. The largest ballcourt at Pusilha is located at the southern end of a sacbe. This probably reflects an association with the underworld.

Pusilha, too, has a very large royal acropolis, certainly the most complex in the Southern Belize Region.

Lubaantun, like Nim li Punit, is built along a north-south axis (Figure 3). At both of those sites, the highest points are the north and the lowest in the south. There is scant evidence, however, that north is associated exclusively with ancestor worship at either site. At Nim li Punit, the northernmost group is residential in character. This is probably the case at

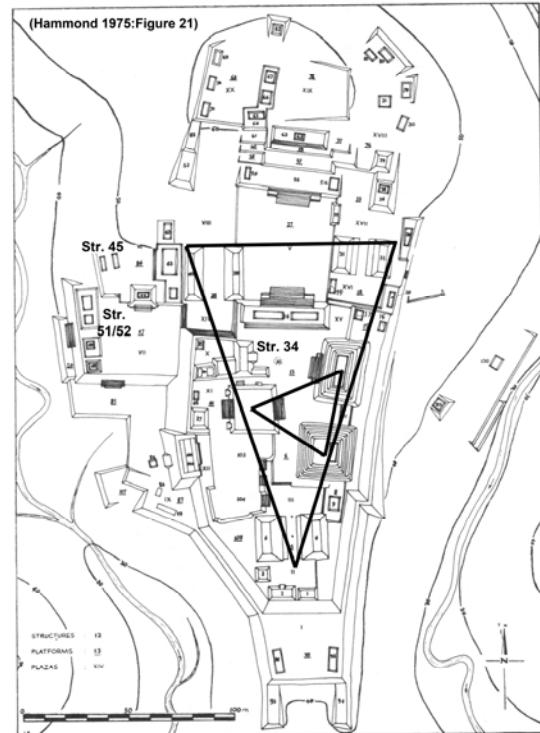


Figure 3. Map of Lubaantun showing structures excavated by the TRIP as well as triangles formed by pyramids and ballcourts.

Lubaantun, but Hammond (1975) did find a cache containing the teeth of two individuals in one of the northernmost platforms at that site. A similar double tooth cache was recovered in Burial 3/1 of Pusilha in a context that strongly suggests ancestor veneration (Pitcavage and Braswell 2010).

The center of Lubaantun is defined by two triangles. Three pyramidal platforms—Structures 10, 12, and 33—lie at the center of the site and are arranged in a roughly equilateral triangle. Only one—Structure 33—contains stairs that climb to the top of the platform. We suspect that these three structures represent the three hearthstones of Maya creation, thought to be in the constellation Orion, and for that reason are the tallest platforms built at the site. A larger triangle surrounds the epicenter of the site and is formed by three ballcourts—Structure 4, Structures 21 and 22, and Structures 39 and 40. These ballcourts occupy a much lower position than the three pyramidal platforms and are probably associated with the underworld. This

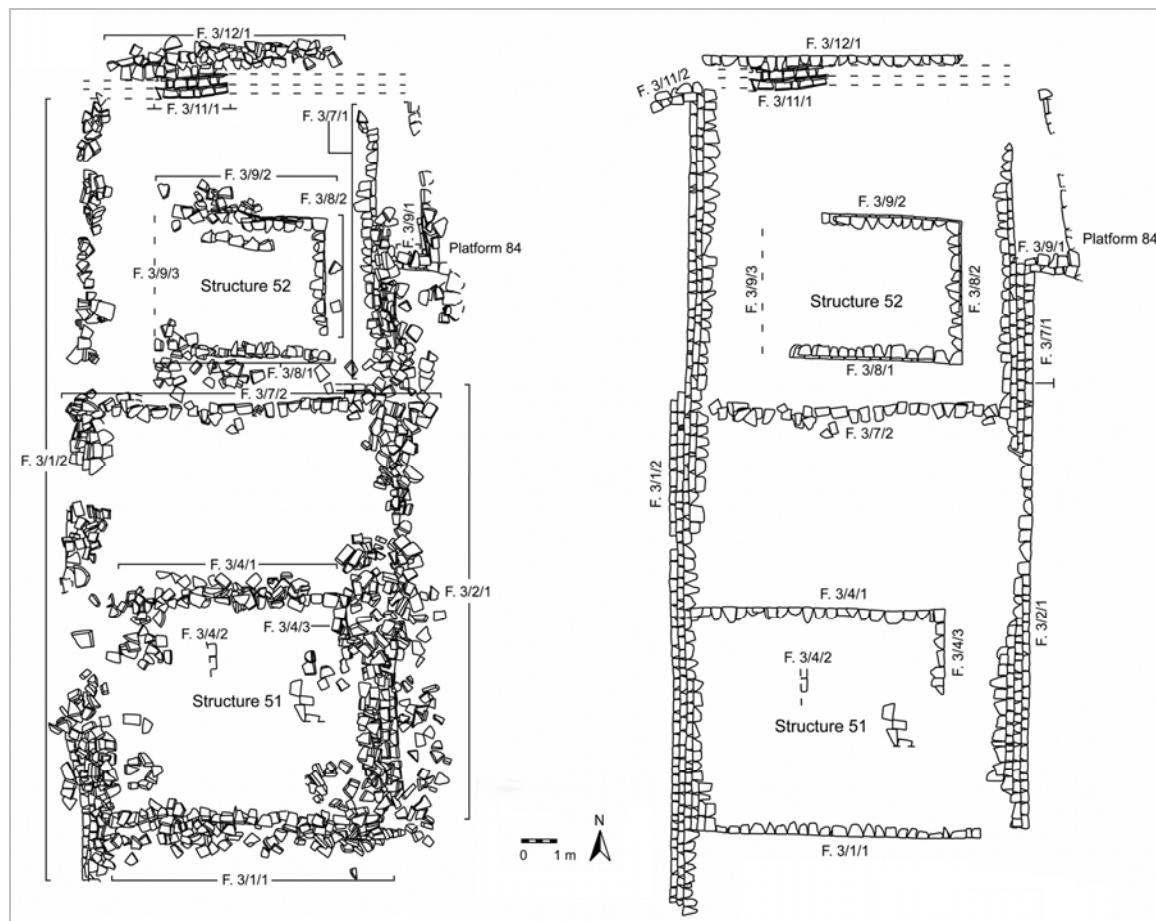


Figure 4. Structure 51/52 before and after excavation and consolidation.

precise pattern of two inscribed triangles is unique in the Maya world, but may serve to mark Lubaantun as an *ox te tun*, or three stone place, one of many in the Maya area. It is important to note that if our interpretation of site planning principles at Lubaantun is correct, this plan probably emerged late in the construction history of the site. According to Hammond (1975), the ballcourt formed by Structures 21 and 22 were built during the last Terminal Classic phase of construction at the site, and the ballcourt formed by Structures 39 and 40 appears to be unfinished.

Excavation of Structure 51/52

We began our excavations in 2009 at Structures 51 and 52, located in Plaza VII (Figure 4). The size, form, and location of these structures suggested to us that they probably were residential in character. This

portion of the site was built during Phase IV of Hammond's (1975) five-phase construction sequence for Lubaantun, that is, sometime shortly before or shortly after A.D. 800. The purpose of our excavation was to collect ceramic and other materials dating to this time for comparison with artifacts we recovered at Pusilha. We also hoped to recover later materials that would allow us to date the abandonment of the structure, and also to definitively determine the function of the platform.

Structures 51 and 52 are best considered to form a single platform built in two stages. It is marked on site maps as two structures because an old and collapsed looter's trench near the centerline creates the impression of two platforms. The eastern corners of the structure were also dismantled in an attempt to locate corner caches. The platforms of Lubaantun do not contain rich axial caches

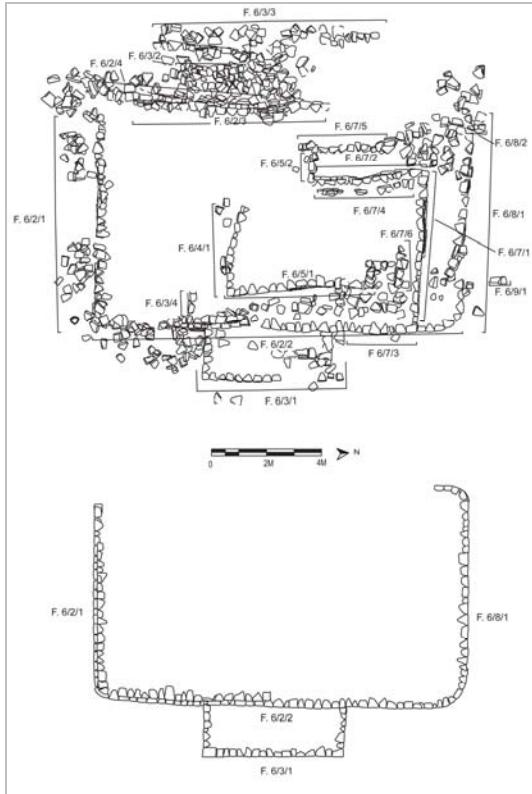


Figure 5. Structure 45 before and after excavation and consolidation.

or burials, and corner caches typically consist of jute shells. It is unlikely, therefore, that the looters of Structure 51/52 recovered much of interest.

The construction of the first stage of the platform was contemporaneous with the building of Plaza VII. We know this because we encountered unbroken dry fill from bedrock to the top of the platform in its southern half. The plaster floor of Plaza VII does not extend under the southern half of the platform. Within the core of Structure 51, we found well-built retaining walls made of cut but undressed stones. The use of cut stones for fill retaining walls is common at Lubaantun. During a later stage, the platform was extended to the north, and built over the well-preserved plaster surface of Plaza VII. A square bench or superplatform was built on top of this addition.

Ceramic analysis has only just begun, but we have already noted at least two periods of construction and use. A large concentration of pottery below the southern

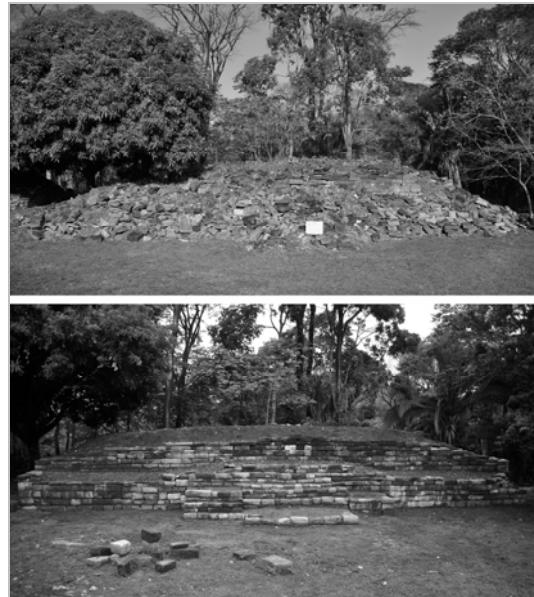


Figure 6. Structure 34 before excavation and after consolidation.

end of Structure 51/52 contained many types and modes diagnostic of Tepeu II and early Tepeu III times—including Louisville Polychrome and Belize Red—but no Fine Orange was identified. At Pusilha, we do not find Belize Red in contexts dating to before the Terminal Classic. Also recovered from this deposit were typical Lubaantun-style figurines and obsidian from the El Chayal source. We tentatively date the construction of Plaza VII and the southern half of Structure 51/52 to the early Terminal Classic, roughly A.D. 780-830. In contrast, materials collected from outside the platform and above the plaza surface are quite different. Here, we found only trace quantities of polychromes (probably from collapsed fill), greater quantities of the coarse local type called Puluacax Unslipped, more Belize Red, and some Fine Orange pottery. Lubaantun figurines are missing from these later contexts, and the obsidian consists of a mix of material from El Chayal and a Mexican source tentatively identified as Ucareo. We provisionally date this period of use of Structure 51/52 to the later Terminal Classic, A.D. 830-900+.

Serving and storage vessels dominate the ceramic assemblage from outside the structure. No censers were recovered, and

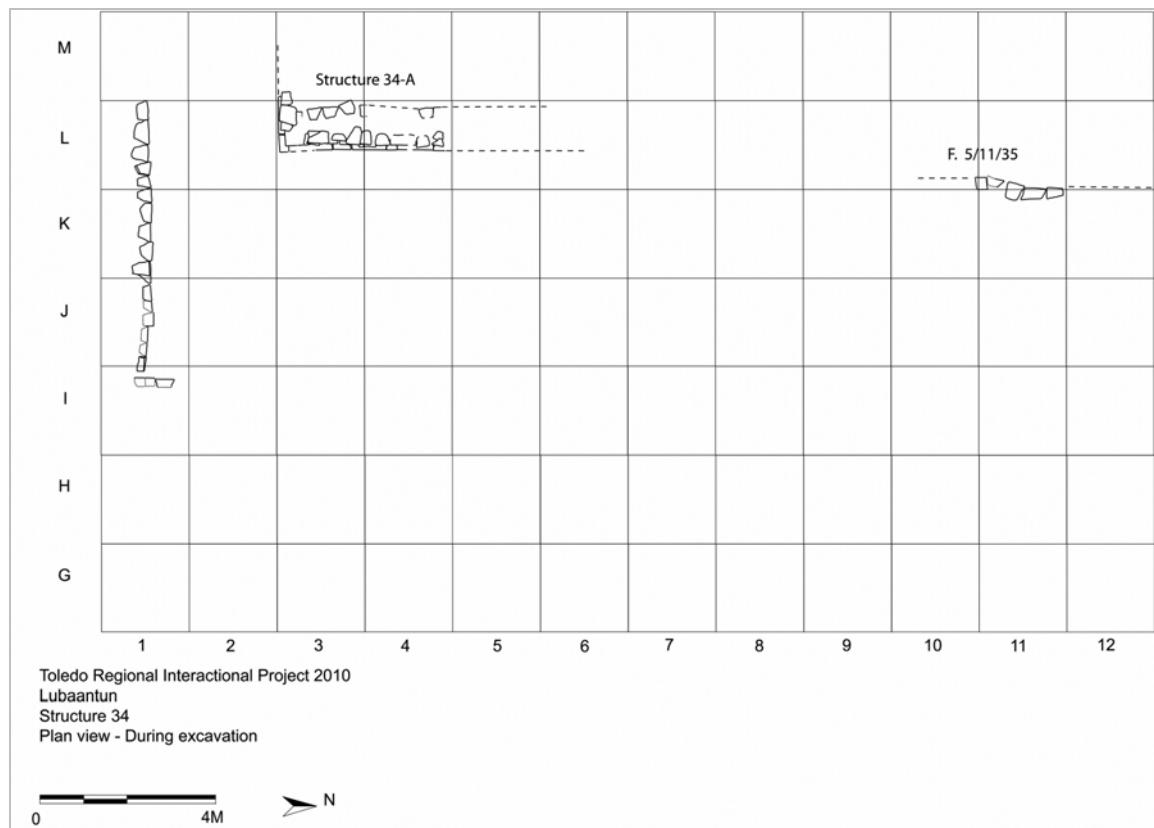


Figure 7. Structure 34, Stage I.

cooking vessels were relatively infrequent. Jute shells also were common. For these reasons, Structure 51/52 probably supported an elite residence where food was served but cooking was not a frequent activity.

Excavation of Structure 45

In 2010, we excavated Structure 45, a low platform 15m northeast of Structure 51/52. In Hammond's (1975) map of Lubaantun, Structure 45 is shown as two low, parallel mounds, perhaps forming a very small ballcourt. He dates construction of this small patio group to Phase II, that is, well before Plaza VII and Structure 51/52. We excavated Structure 45 in order to recover ceramics and other artifacts dating to the Late Classic period, and also to determine its function.

Our excavations quickly revealed that Structure 45 consists of a single platform (Figure 5). The low saddle running north-south in the middle of the platform was

probably created by root action and tree fall. We found no evidence of looting. In any event, Structure 45 is clearly not a ballcourt. The earliest construction stage was contemporary with the building of the patio called Platform 84 by Hammond (1975). As in Structure 51, we found an uninterrupted layer of fill beginning at the buried ground surface and continuing to the top of the first stage of the platform. The patio floor does not run underneath the substructure of Structure 45. This first stage platform was rectangular and supported a rectangular superplatform. The second stage of construction consisted of raising the plaza level almost to the top of the Structure 45 substructure. The third stage is a raised extension to the north and south, and the addition of a stair block. Round corners characterize this stage of the platform. Finally, a rough extension made of cobbles was added to the north of the platform during the fourth stage of construction.



Figure 8. Structure 34A showing outset molding.

Artifacts recovered from Structure 45 differ somewhat from those found associated with Structure 51/52. Here, we recovered relatively few ceramics, but a large proportion of them are cream-slipped polychrome serving vessels. As at Structure 51/52, no censers were found. Curiously, no figurines were found during the excavation of Structure 45, although one was recovered from the terraces west and below the platform. Finally, the obsidian of Structure 45 consists of material from El Chayal and a small but significant percentage of material from the Ixtepeque source. Structure 45 yielded twice as much obsidian as we found in Structure 51/52, implying a social distinction in access or, more likely, a difference in the availability of material during distinct periods. On the basis of the ceramics and obsidian, we tentatively date the construction of Structure 45 to the Late Classic period, but occupation seems to have continued into the early Terminal Classic. Like Structure 51/52, Structure 45 probably

supported an elite residence where food was served but only infrequently prepared.

Excavation of Structure 34

In 2010, we also excavated Structure 34, the largest unlooted and unexcavated platform at the center of Lubaantun (Figure 6, top). Hammond (1975) argues that it was built during Phase II of his sequence, that is, during the Late Classic. He also suggests that it served as a “minor religious structure” (Hammond 1975: Figure 32). Our excavations of Structure 34 reveal that it was built in at least six major stages, with several minor episodes of construction.

Stage I was contemporary with the construction of Plaza IV, on which Structure 34 stands (Figure 7). It is represented by Structure 34A, a well-built east-west platform consisting of a vertical wall with both stepped insets and an outset molding that—at the risk of re-opening a long settled debate—might be called an example of the “In-and-Out” style (Figure 8). We encountered this outset molding in both deeply buried and currently exposed contexts, and are positive that it is deliberate rather than the result of root action or fill expansion (see Hammond 1975; Joyce et al. 1927; Larios 1998). During Stage II, a two-bodied extension was added to the east of Structure 34A, and another structure containing a preserved plastered bench—was built to the north (Figure 9). Stage III consisted of dismantling this northern structure and covering it with a shrine that supported a low stone superstructure (Figure 10). This shrine is nearly identical in form and size to a consolidated structure near the southwest corner of Structure 33. During Stage IV, the final footprint of Structure 34 was established and covered these early buildings (Figure 11). Stage IV consists of three distinct moments or substages, when the top of the platform supported first a rectangular superplatform and then two later successive C-shaped superplatforms. During Stage V, Structure 34 reached its current height and was expanded significantly to the west (Figure 12). At this

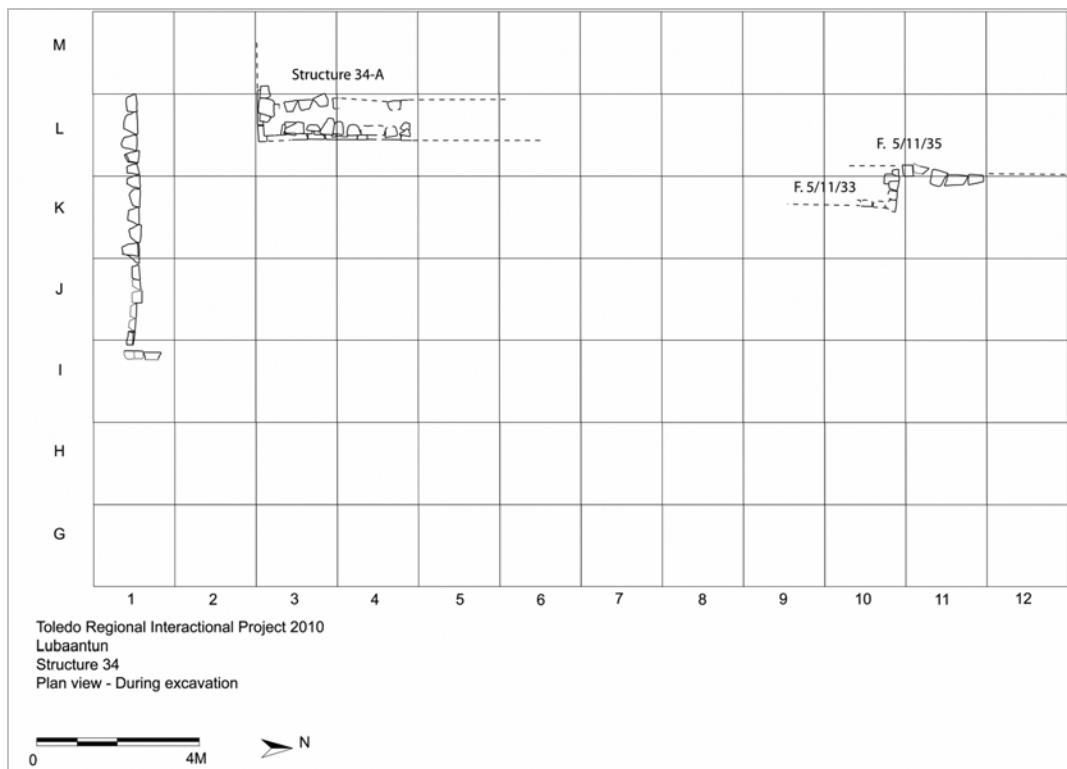


Figure 9. Structure 34, Stage II.

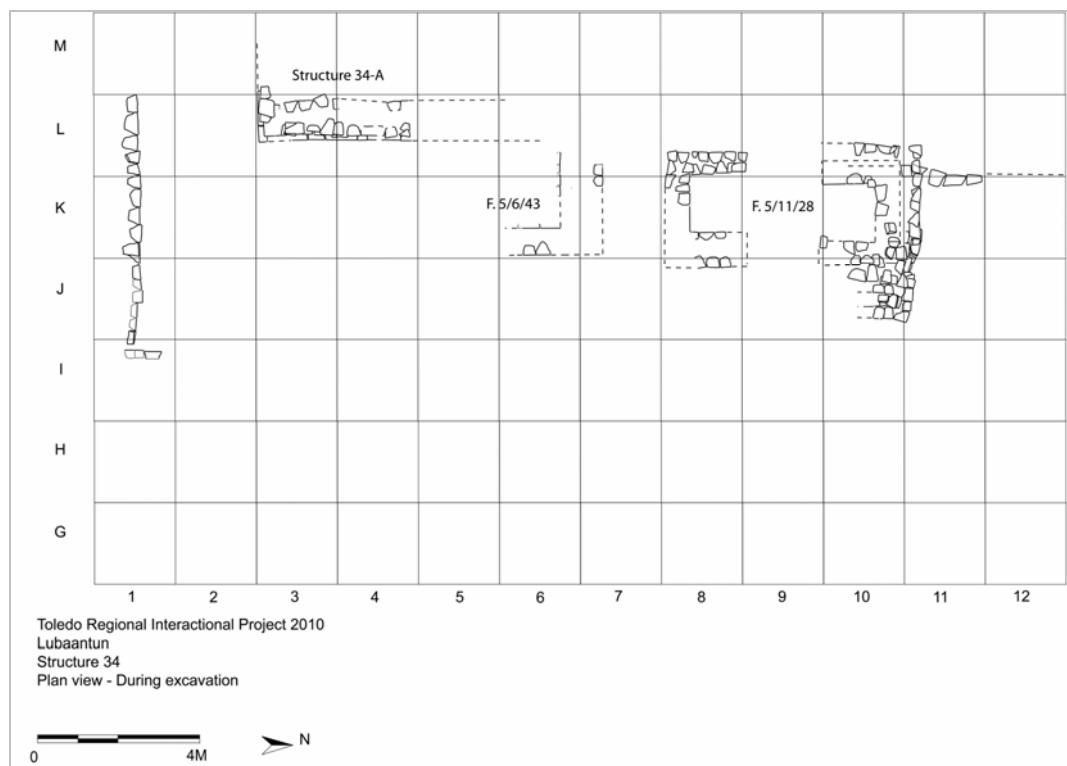


Figure 10. Structure 34, Stage III.

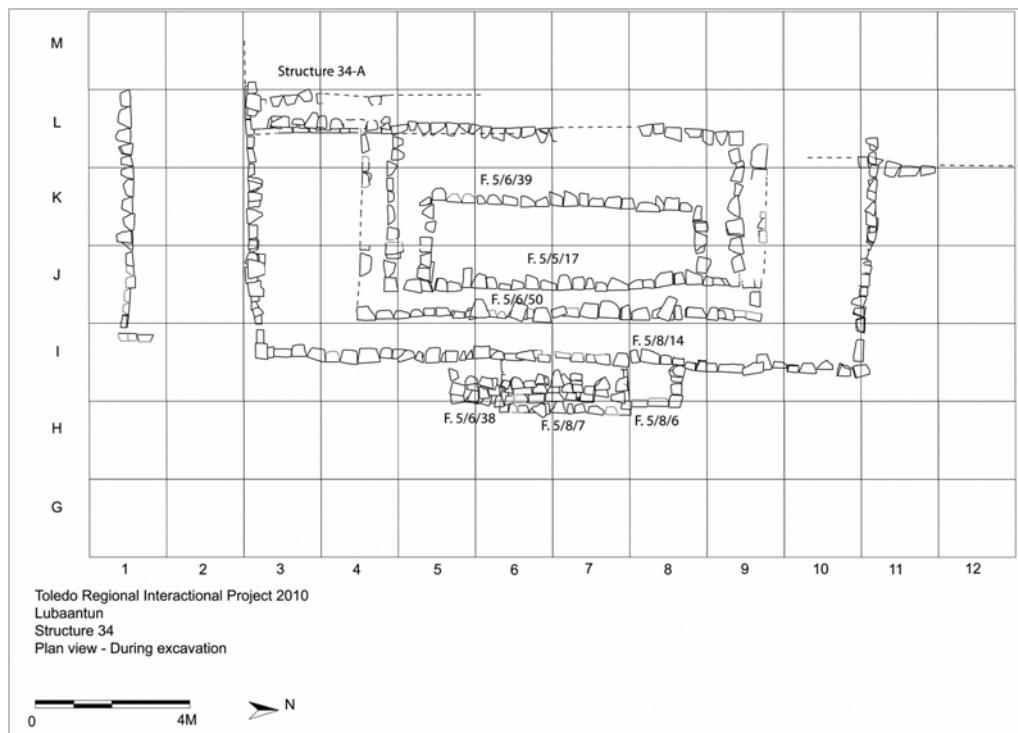


Figure 11. Structure 34, Stage IVc.

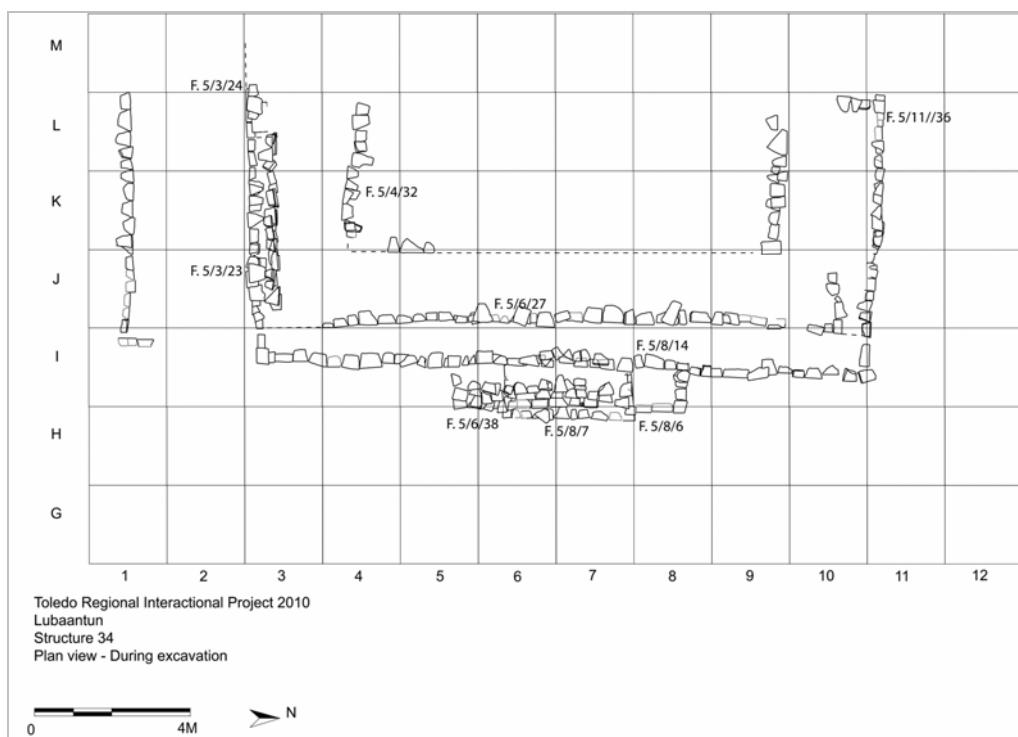


Figure 12. Structure 34, Stage V.

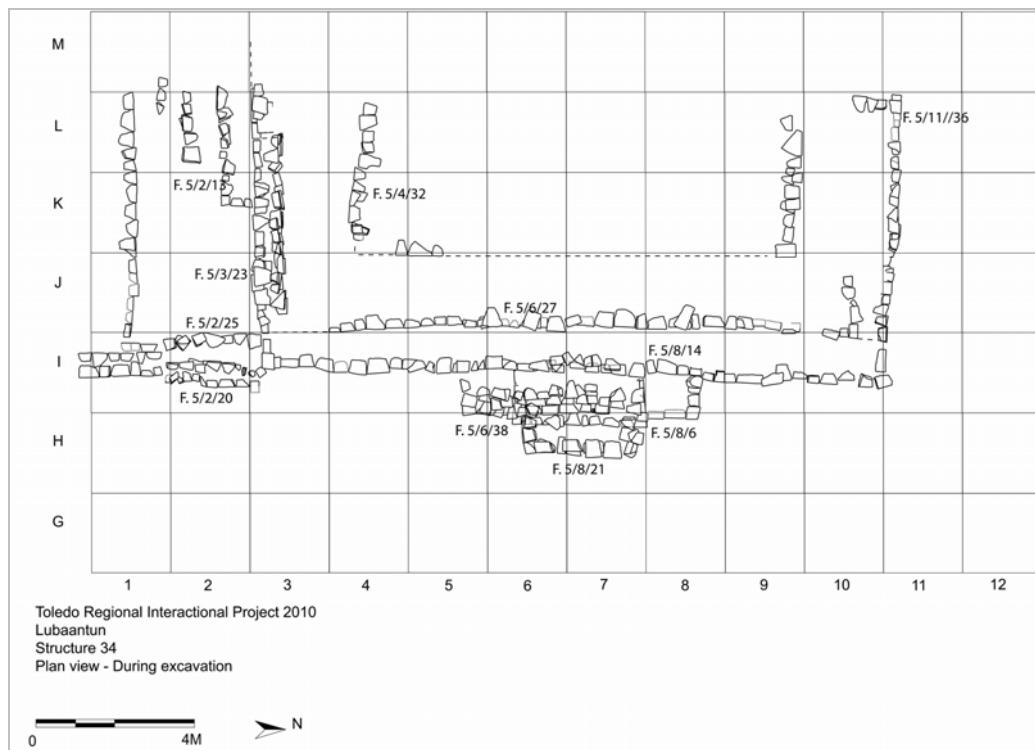


Figure 13. Structure 34, Stage VI.

time, Structure 34 appears to have been surmounted by a rectangular superplatform.

Stage VI consists of minor additions to the southern end of the structure that greatly changed its function. Low walls were added to the southeastern corner of the platform and connecting it to Structure 33. A bench was added to the narrow corridor between Structures 33 and 34 (Figure 13). We suspect that a perishable roof spanned the gap between the two buildings. We found enormous quantities of pottery, animal bones, jute shell, and lithic artifacts within this space. This material dates to at least the early facet of the Terminal Classic period. Thus, although the construction sequence of Structure 34 began in the Late Classic with one or more religious structures, during the Terminal Classic the south end of the platform was transformed into a residence. Our consolidation of Structure 34 preserves it as it stood during this sixth and final stage (Figure 6, bottom).

Conclusions

After two seasons of fieldwork at Lubaantun, we are turning now to artifact analysis in order to answer our questions about regional integration in southern Belize. Moreover, we can now make provisional comments about the relationship between Pusilha and Lubaantun—two of the three sites studied by TRIP project members.

First, site-planning principles are different at the two sites. Pusilha has a distinct northwest-southeast axis and contains a unique architectural configuration that we call the “Special Function group.” In contrast, the center of Lubaantun is built on a north-south axis and has a unique pattern of inscribed triangles formed by pyramids and ballcourts.

Second, our working ceramic chronology for Lubaantun contains three phases: one corresponding to Tepeu II and two to Tepeu III times. We have yet to identify a Tepeu I component, and it seems probable, as Hammond (1975) argues, that the site was not occupied before A.D. 700.

We have not yet identified a Postclassic component. This contrasts with Pusilha, which was occupied not only in early Late Classic times, but also into the Postclassic period.

Third, Lubaantun and Pusilha are both Tepeu-sphere sites with ceramic ties linking them to the Peten. In some ways, the ceramics of the two sites are similar, but in others they are quite different. The comal is a common form at Pusilha, but we have so far found just two possible griddle sherds at Lubaantun. This suggests that the food ways of the two sites were different, and—by extension—that the inhabitants of the two nearby kingdoms may not have shared a regional identity. Zoned stamping is common on jars at Lubaantun, but jars from Pusilha are generally striated. Lubaantun-style coarse vessels of the type Puluacax Unslipped are found at Pusilha (and also at Nim li Punit), but are much less common at those two sites and date largely to the Terminal Classic period.

Fourth, the external connections exhibited by Lubaantun and Pusilha are different. Belize Red was first traded to Lubaantun during the Late Classic. It does not appear at Pusilha until the Terminal Classic. The dominant source of obsidian at both Pusilha and Lubaantun is El Chayal, but the inhabitants of Pusilha had much greater access to obsidian than did their neighbors at Lubaantun. To date, we have recovered just 200 pieces of obsidian at Lubaantun, but more than 4,400 have been found at Pusilha. Moreover, Ixtepeque obsidian is proportionally more common at Lubaantun and Nim li Punit than at Pusilha, perhaps indicating that these sites had more significant ties with the southeastern Maya periphery than did Pusilha. Access to Mexican source obsidian is also different. During the Terminal Classic, green obsidian from Pachuca and black material from the Zaragoza source reached Pusilha. So far, the only exotic obsidian found at Lubaantun appears to come from the Ucareo source. We have found no Mexican obsidian at Nim li Punit. Finally, the inhabitants of Pusilha used local Toledo sandstone to make manos

and metates, but also imported finished grinding stones made of Guatemalan lava stone, green and pink tuff from the highlands of eastern Guatemala or western Honduras, and various materials from the Mountain Pine Ridge. In contrast, all the groundstone from Lubaantun is either local or made of Guatemalan lava stone. Pusilha, Lubaantun, and Nim li Punit do not appear to have procured groundstone from sources in the Maya Mountains.

As work progresses at all three sites studied by the Toledo Regional Interaction Project, we will map out exchange connections between the sites in Southern Belize with the goal of determining whether or not they participated in the same regional system. Despite some similarities in architecture and ceramics, at present it seems as though the ancient inhabitants of inland Toledo District had distinct identities, historical roots, and political affiliations. We currently wonder, as did MacKinnon (1991), precisely how Southern Belize was integrated, and whether or not it should be considered as a unified region.

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10 IDENTIFYING THE EXTENT OF ANCIENT MAYA DITCHED FIELD SYSTEMS IN THE RÍO HONDO VALLEY OF BELIZE AND MEXICO: A PILOT STUDY AND SOME OF ITS IMPLICATIONS

Thomas H. Guderjan and Samantha Krause

For more than two decades, archaeologists have recognized that the ancient Maya (AD 250-850) economy was at least partially based upon intensive agricultural systems. Early studies that identified ditched agricultural field systems along the Río Hondo, elsewhere in northern Belize, and along the Gulf coast of the Mexican state of Tabasco opened the door to re-examination of Maya political economies. For 19 years, we have been working at the Maya site of Blue Creek at the inland terminus of the Río Hondo and have been investigating the ditched agricultural fields at the site for a decade. Aerial reconnaissance in 2008, 2009 and 2010 have revealed that we were not dealing with a nodal situation but that the extent of agricultural intensification in the river valley is still uncertain. We present new data resultant from aerial photography, mapping and GIS that will enable us to better understand the scale and nature of ancient Maya agricultural systems.

Introduction

This study arises from two decades of research at the headwaters area of the Río Hondo, which forms Belize's border with Mexico. During that time, the senior author and our colleagues have regularly argued that the Río Hondo was a major transportation route for goods to and from the Caribbean Sea. During the course of our investigations at the Maya site of Blue Creek, we also discovered extensive sets of ditched field complexes along the base of the Bravo Escarpment. Since then, these have become the subject of long-term, intensive research (i.e., Baker 2003; Beach, et al. 2002, 2008, 2009; Guderjan 2007; Guderjan, et al. 2009; Luzzadder-Beach and Beach 2009). Despite a decade of fieldwork and acute knowledge of the groundbreaking work done by others dealing with such intensive agricultural systems, we and our colleagues have generally regarded the ditched fields at Blue Creek and along the base of the Bravo Escarpment a nodal situation. In other words, despite the fact that we knew of the well-documented fields in the vicinity of the village of San Antonio in the Río Hondo floodplain, we viewed the agricultural systems of Blue Creek as isolated, disconnected and somewhat unique. However, a casual flyover of the river in 2008 yielded photos of what

appeared to be previously unrecorded ditched wetlands upstream of San Antonio. This soon led to the realization that the ditched fields of the Río Hondo floodplain were probably not entirely recorded despite the intensive research that had preceded ours. Further, we know individuals in contemporary agribusiness who are currently clearing areas of the upper Río Hondo who were incidentally exposing locations which likely have ancient field systems that would now be more likely visible. Consequently, I decided to determine whether we could locate and better record the presence of these systems in the Río Hondo valley.

This paper is the first progress report of our ongoing efforts to better understand the scope and scale of the Río Hondo ditched field systems. Further, I believe that by doing so, we will come to a far better understanding of the role of large-scale agricultural production in the macro-economies of the ancient Maya.

Previous Research

The "Old Orthodoxy" prior to the 1970's was that ancient Maya populations were quite low and subsisted exclusively on swidden agricultural methods (Siemens 1992). However, this paradigm was showing severe cracking and faults by the

1960's as fieldwork was increasingly pointing to much higher prehistoric populations than could be accounted for with intensified agriculture. The ancient Maya had become the world anomaly that Karl Wittfogel's hydraulic agricultural theories (1957) could not explain. However, the documentation of large scale ditched agricultural systems along the Río Candelaria in 1968 largely exploded this paradigm (Siemens and Puleston 1972). This was soon followed by the discovery of extensive field systems along the Río Hondo along the Belize-Mexico border (Siemens 1982, 1992). This clearly confirmed that ancient Maya people were not simple horticulturalists but engaged in large scale intensive agricultural that could and did support many times the numbers of people supportable by slash-and-burn methods. Puleston's work moved to the Río Hondo but was terminated by his untimely death, to later be completed by his colleagues and other students from the University of Minnesota (Pohl 1985) and expanded upon by others (Harrison and Turner 1987). Heated debate arose regarding whether the ditches and therefore the agricultural systems were "real", i.e., human-made or natural features. Today, all parties that I know of concur that the original assessment, that "ditched fields" were dug by ancient Maya people to reclaim wetlands for intensive agriculture, was correct. Current research is now focused on understanding when canals were built, the circumstances of their construction and what species were grown in them (i.e., Beach, et al. 2006; Beach, et al. 2009; Bozarth 2009) and their relationship to factors influencing Maya abandonment (Harrison 1990; Guderjan, et al. 2009).

The distraction caused by the "real or not" debate left important issues by the wayside. Principally, the physical extent of ancient Maya intensive agriculture is not well-understood, despite Siemens' map showing what appears to be 11 sets of fields along the Río Hondo, nine more in the bajos near Dzibanche in Quintana Roo, nine along the New River, three between the New River

and the Río Hondo in Belize and nine others along the Candelaria drainage on the other side of the Yucatan Peninsula (Siemens 1983). Siemens further estimated that 3,200 hectares of ditched fields were located in Belize (1983). This seems very conservative when contrasted to recent estimates of 256,000 acres (103,600 acres) of ditched, intensive fields along the Salt River in southern Arizona dug by the prehistoric Hohokam people (c.f., Fagan 2010). At the liberal end of such estimates is that of Harrison and Fry, who published maps showing vast areas believed to be under intensive cultivation (Harrison and Fry 2000). Unfortunately, the bases for the estimates, numerical or graphic, are not well explained in either publication, so it falls to others to refine these estimates more realistically. More importantly, I argue that discussions of Maya political economy still fail to integrate the role of these agricultural systems into adequate models of macro-economics, production and trade. These agricultural systems produced not only food but a wide array of agricultural non-food products and the southern Maya lowlands in which the Candelaria and Hondo are found was actually a Maya "bread-basket", providing products to the equally highly populous Northern lowlands (Merida, Chichen Itza, etc.) which did not have access to the highly fertile soils of the south. As Harrison and many others have now noted, the northern Belize-southern Quintana Roo zone not only includes the Río Hondo floodplain, but also large scale *bajos* that provided an enormous agricultural resources base (Beach, Luzzadder-Beach and Dunning 2008; Beach, et al., 2002; Harrison 1990, 1993) in particular when contrasted with the relative paucity of soils available in the northern Yucatan zone.

Wetlands Agricultural Research at Blue Creek

The senior author's experience with wetlands agricultural systems was extremely minimal prior to 1999 when he documented sets of ditched agricultural fields at the base of the Bravo Escarpment, very close to the

site of Blue Creek. While he had previously documented sets of fields at Irish Creek, their presence at Blue Creek aided in explaining why the site had exhibited so much conspicuous consumption by its residents (Marroquin 2009). The initial field work in the ditched fields at both Blue Creek and Irish Creek was conducted by Jeff Baker for his doctoral research in 1999, 2000 and 2001(Baker 2003).

Since 2002, at Jon Lohse's invitation, a major research initiative has been led by Tim Beach and Sheryl Luzzadde-Beach. One major outcome of this work are new and surprising models of the development of these fields systems (Beach and Luzzadde-Beach 2009; Beach, et al. 2009; Guderjan , et al., 2009). Chan Cahal is a residential component of Blue Creek approximately 2 kms. northeast of the public precinct, located on a slightly elevated area with ditched fields between it and the Bravo Escarpment some 500 m. to the west. The Chan Cahal model indicates that at least some ditching was not the consequence of early intensification but, instead, was a response to the impact of upland erosion due to earlier intensive clearing and cultivation. Stage 1 (2500–600 BC) of the depositional sequence at Chan Cahal represents a period of relatively stable ground surfaces on which Maya agriculture began and a water table approximately two meters lower than today. Stage 2 represents aggradation of eroded soils from the uplands. Stage 3 (AD 120–700) represents the increasingly rapid aggradation from upland erosion and especially gypsum precipitation. This material is as much as two meters thick covering as many as 10–15km². Stage 4 marks the construction of a massive network of ditches into the Stage 3 materials. Beach, et al. frame the date of this construction as being more recent than the sediments it intruded into (300 BC–AD 700) and later than the earliest dates from Stage 5 (AD 870–1010), the sedimentary infilling of these ditches (Beach, et al., 2009).

Concurrent studies by Steven Bozarth (i.e., 2009) show considerable

pollen and phytolith evidence for cultivation of fruit trees, including breadnut (*Brosimumalicastrum*), craboo or cha (*Byrsonima* species), caimito, agya, or sebul (*Chrysophyllum* species), chicle macho, chiquibul or chicle (*Manilkara* species), Cacao (*Theobroma cacao*) or mountain cacao (*T. bicolor*), and avocado (*Persia*). At least one species of *Marantaceae*, probably platanillo (*Pleiostachyapruinosa*) or wild banana (*Stromanthejhalmarssonii*) was grown for large leaves used as food wrappers and disposable plates. Additionally, maize (*Zea mays*) and sweet potato (*Ipomoea*) pollen were found.

Further, we have identified and excavated an Early Postclassic period field house dating to approximately AD 1100 in the Birds of Paradise fields located approximately 2.5 kms southeast of the Blue Creek public precinct (Preston and Majewski 2010). This feature, importantly, demonstrates that these ditched agricultural fields were utilized at least 200 years after the general abandonment of the site and area. Furthermore, the ditches had not been maintained and had largely infilled during this period. While well maintained, the ditches were useful as canoe access routes into and out of the field complexes. By AD 1100, they would have been muddy, soft, impediments to access. My view is that this reflects that the Classic Maya were planting species such as cacao which would still exist as relict communities for 200 years and still have economic importance.

Despite our increasingly nuanced information about fields at the base of the Bravo Escarpment and our understanding of the research by Harrison, Pohl, Puleston, Siemens, and others, we saw the Blue Creek fields as nodal and there was little or no focus on the extent of these agricultural systems or their larger role in ancient Maya economies. So, when I incidentally photographed what were likely to be previously unrecorded fields on the Mexican side of the Río Hondo in 2008, my interest and those of my colleagues were attracted to better understanding the extent of these fields.

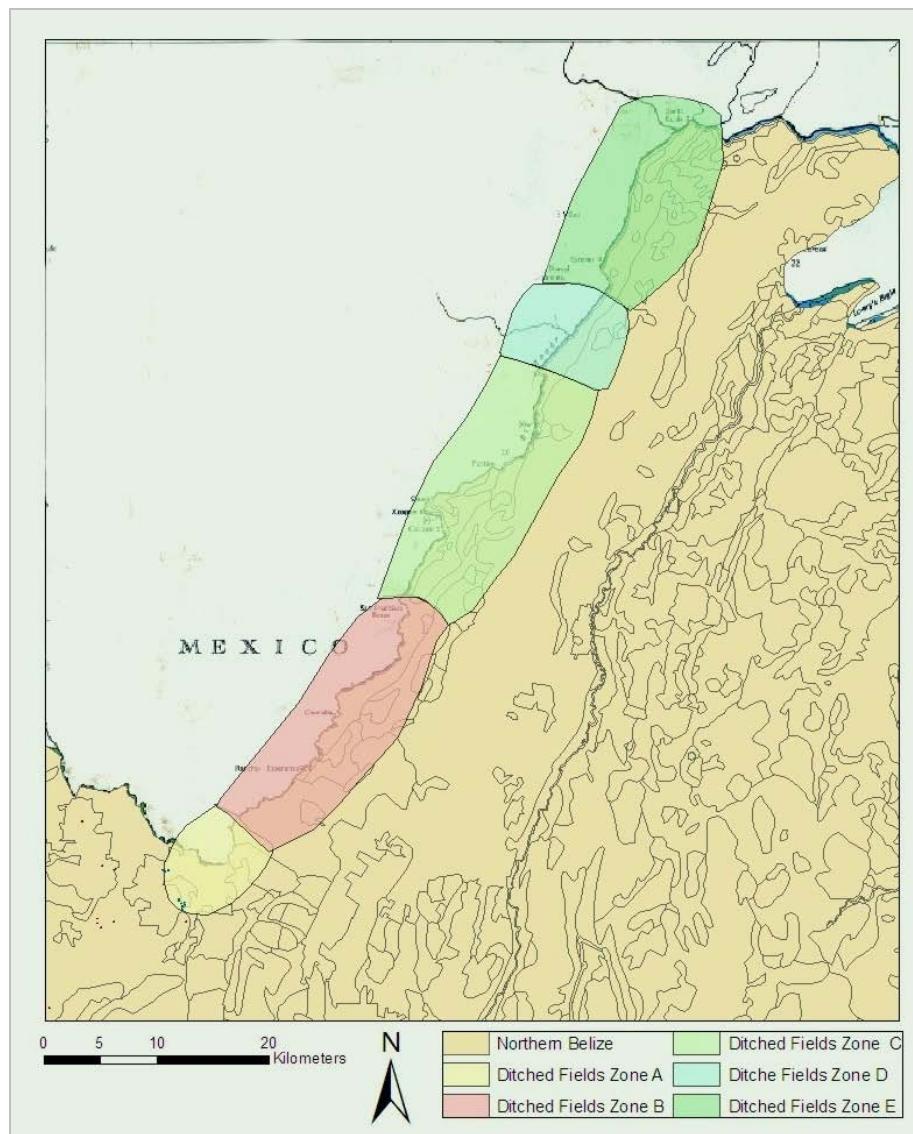


Figure 1. Map of Río Hondo showing zones discussed in text.

Methods

In 2010, we conducted approximately 12 flights over the Río Hondo valley from the Mennonite community of Blue Creek to Corozal Bay. By using digital cameras with time tagged images calibrated to a real-time Global Positioning System (GPS) unit, we were able to place our aerial images into a geo-referenced Geographic Information System database. Our first flights were intended to determine whether we could visually identify and document ditched field systems from the air as easily as we hoped. Once we knew that to be the

case and once we established protocols for photographing and documenting fields and geo-referencing images, as well as having then documenting many sets of fields, we flew several flights with the goal of identifying additional sets of fields. Then, we flew several flights to re-confirm our spatial data and to secondarily continue to search for additional fields.

Outcomes

We have documented minimally ten sets of ditched fields in the Río Hondo floodplain (Figure 1). As expected, most

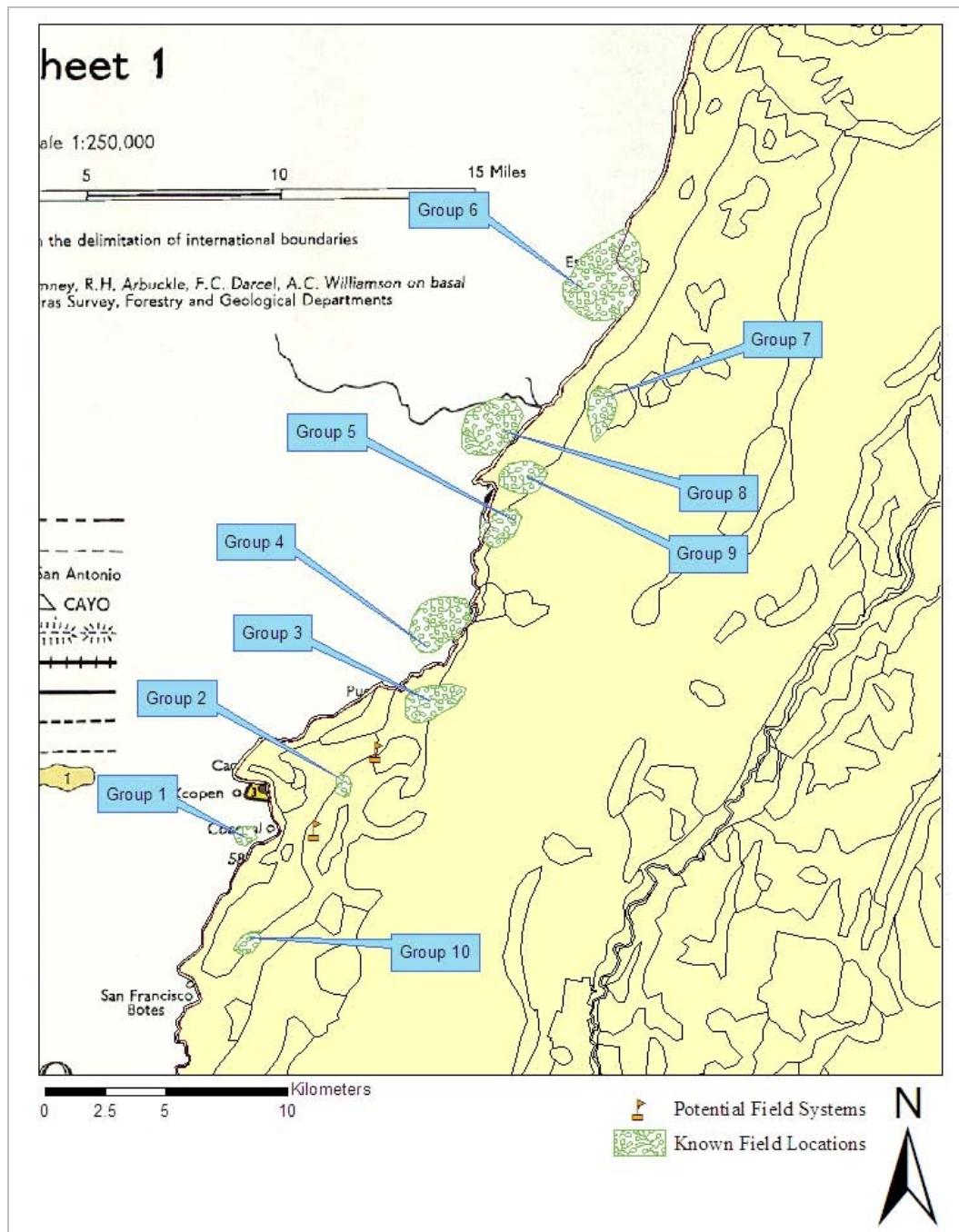


Figure 1. Map of Río Hondo showing identified groups of ditched fields.

fields we documented were near Albion Island including those fields that have been documented by previous research. Following that observation, it became convenient and useful to divide the Río Hondo valley into five units (Figure 2).

Zone A, or the Blue Creek Zone, begins at base of the Bravo Escarpment and extends along the base of the escarpment south some distance into the Río Bravo Conservation Area. Included in this zone are the Chan Cahal and other fields at Blue



Figure 3. Photo of ditched fields at Blue Creek, showing infilled fields, prehistorically unditched wetlands (upper right), and modern backhoe trench through them.



Figure 4. Type 2 ditched fields adjacent to the Río Hondo.



Figure 5. Type 3 ditched fields located at the base of the terraces of the Río Hondo.

Creek site as well as the Birds of Paradise fields between Blue Creek and Gran Cacao. However, along the Río Hondo in this zone, we see a paucity of ditching. A possible or partial cause of this paucity is that in intense rainy seasons, this zone sees rapid flooding as waters from the Río Azul canyon rush out onto the floodplain. Consequently, evidence of prehistoric ditches may well have been destroyed.

Zone B, the Upper Río Hondo Zone, begins approximately 1-2 miles downstream of where the Río Azul/Hondo converge with the Río Bravo in the Belize Mennonite community of Blue Creek and across the river from the Mexican community of La Union downstream to approximately the southwest end of Albion Island. Albion Island is formed by the main course of the Río Hondo on its north side and a relict channel of the river forming its southern side. This zone is the most forested and despite the presence of high probability soils, we were unable to document any fields. For better or worse, this zone is now being actively cleared for modern

agriculture. So, it is likely that visibility is soon to increase and in 5-10 years we will know if ditched fields exist here.

Zone C, the Middle Hondo Zone, includes the next approximate 20 kms. downstream, including Albion Island and another approximately 10 kms. It is in this zone where we have documented the greatest number of field complexes. This is not surprising given that most if not all of these have been previously documented or at least seen (i.e., Siemens 1983; Figure 5).

Zone D, the Lower Middle Zone, is similar to the previous in its general location and characteristics. Visibility is high in this zone, yet few sets of fields were identified. However, there is one very large set on the Mexican side of the river which exhibits exceeding linearity and scale. This is certainly the largest field we have yet identified.

Zone E, the Lower Río Hondo, from approximately the Mexican village of Estevez to Corozal Bay, is apparently devoid of ditched fields. In this area, visibility is very good upstream of the Santa Elena border crossing and we are quite

certain that additional efforts will not yield newly documented fields. Below the border crossing, modern activity has most likely destroyed any evidence that once existed.

We have also been able to identify three common field settings in which fields are located:

1. They are commonly found surrounding low-lying areas on the floodplain. In several cases, where low lying areas exist in the Río Hondo floodplain of at the base of the Bravo Escarpment. One such set of fields (Figure 3) was the location of Baker's doctoral research at Blue Creek (2003).

2. They are commonly found surrounding wetlands (swamps) adjacent to the Río Hondo (Figure 4). In a number of cases, we identified locations where streams joined the Hondo or where old channels of the Hondo diverted from the main course. In these cases, the margins were channelized but not the deepest wettest central section. Functionally, both these and those in the previous setting are similar in that they drained water from or out of marshy low-lying areas. Importantly, soils immediately adjacent to these fields but at very slightly higher elevations appear to be as useful as those that were drained. Consequently, this appears to be a "tip of the iceberg" situation in which the presence of the ditches may be revealing only a small part of a much larger ancient agricultural system.

3. We found several sets of ditched fields located at the bases of terrace slopes as they drop to the Río Hondo floodplain (Figure 5). It is uncertain, but very possible, that in these locations, there are low lying areas at the bases of these slopes, probably from old channel activity. This is certainly the case, for different reasons, at the base of the Bravo Escarpment where the Chan Cahal fields are located. If so, then we again may have a "tip of the iceberg" effect. Very likely, the soils immediately adjacent to these ditched fields are equally productive and useful. So, we see this as another case of probable expansion of existing agricultural into more marginal locations.

Some concluding thoughts

The single most striking impression we have of first foray into this research domain is that the likely extent of ancient Maya wetlands agriculture was much more extensive than we understood. While the debate went on regarding whether ditched fields were real or not, we, like others, seemed to assume that they were a localized and not very significant component of the Maya macro-economy. Clearly, this is not the case. If our first impressions are correct, the middle sections (at least) of the Río Hondo were large scale agricultural systems.

Currently, we are looking closely at correlates that will allow us to predict where ditched fields will be located. For example, the soil surveys done by Wright, et al. (1958) are amazingly detailed given their pre-modern technologies. Their natural vegetation categories 23-25, Low Marsh Forest and Herbaceous Marsh Forest, correlate very well with the locations of complexes of ditched fields. To confirm this and to better understand the nature of these agricultural systems, we will need to renew our overflights to better document the details of these ditched fields. Further, we will need to ground truth not their existence, but the details of their setting. And, yes, someone else will need to dig.

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11 HOW THE OTHER-HALF LIVED: CONTINUING DISCUSSIONS OF THE ENIGMA THAT IS KA'KABISH, BELIZE

Helen R. Haines

In 2007, preliminary research was presented from the site of Ka'Kabish, Orange Walk District. Discoveries at Ka'Kabish, initially presumed to be a secondary administrative centre for the larger site of Lamanai, proved the site to be more enigmatic than anticipated. Investigations revealed the site was not only considerably larger than initially predicted, based on an earlier 1995 survey, but ceramic analysis indicated that the site had a significantly longer history than expected (ranging from at least the early Late Formative Period through to the Middle Post-Classic Period). Due to the unexpected nature of the site it was possible only to investigate the section of the site lying to the south of the San Felipe-Indian Church road during the 2007 field season. This paper expands upon our understanding of this perplexing site by focusing on the discoveries made in the northern section of the site during the 2009 field season. It is hoped that with the continued addition of new information we may one day decipher the true nature of the site of Ka'Kabish and understand the role this curious site played in the ancient socio-political landscape of North-Central Belize.

Introduction

Investigations at archaeological sites, particularly those that are the recipients of incipient research projects, are an ever-changing canvass on which the presentation of new information continually causes us to redraw our perceptions about the ancient past. The southern portion of the core area of Ka'Kabish was surveyed and mapped as part of the Ka'Kabish Archaeological Research Project (KARP) in 2007 and the information garnered from that expedition was presented at the Belize Archaeological Symposium that same year (Haines 2008a). In 2009, the northern section of the core zone was surveyed and information from this portion of the site was combined with our previous data to enhance our overall understanding of the centre.

It is not the intent of this paper to reiterate all the work done at Ka'Kabish since the inception of the project. The purpose of this paper is to present new information collected during the 2009 survey. Consequently, the material included here will be largely restricted to that from the northern section of the core zone (for a discussion of the architecture of the southern section see Haines 2008a, 2008b).

Etymology of the Name 'Ka'Kabish'

Recently, confusion over the origin of the site name has emerged. Although the name Ka'Kabish appears to be derived from Yucatecan Maya, as no emblem glyph as yet to be uncovered it is unclear (and somewhat doubtful) if this is the original name of the site. David Pendergast first noted the name in the 1980's, when he and Claude Belanger toured the area while working at Lamanai (Pendergast and Belanger personal communications). Pendergast reported on the existence and state of the site in 1991, at this point the name was already part of the local lexicon and appears to have been in use for several generations (Pendergast 1991).

The name Ka'Kabish, like many Maya site names, is likely a composite word, and, without clear indications of root words or stems (or even intended orthography) various different translations are possible. In its use in the site name Ka'Kabisax (an archaeological ruin near Numk'in, Campeche), Barrera Vasquez list the definition of 'ka'kab' as "aldea, asiento de población, tierra alta y fuerte" (Barrera V. 1995: 283). This root has much to recommend it as a possible basis for the name as the site was clearly at one point a "village, or population seat". The term 'ka'kab' is also listed separately as meaning

“suelo pardo oscuro, de rendzina, humocarbonatado, con poco contenido de humus y con inclusiones de roca caliza” (Barrera V. 1995: 283). This definition is also fitting as the soils on and around the site would definitely fit the definition of rendzina¹ and, as recent excavations have shown, the humus level in the site core is thin with a large layer of limestone cobble fill immediate below. Moreover, part of the site was once used as a limestone quarry during the construction of the road that bisects the site and connects the towns of San Felipe and Indian Church (Haines 2008a, 2008b, 2006; see also Guderjan 1996).

That this term also can imply high firm land makes it equally applicable to Ka'Kabish as the site is located on a ridge of high land; one of several such ridges that intrude upon the otherwise flat coastal plain in this part of north-central Belize (Hammond 1973; Romney et al. 1959). That it can be clearly seen from many points around the region (e.g., Blue Creek, the High Temple at Lamanai, as well as the entry point of the Indian Church Village) may have made its altitude a factor in its naming.

Assuming that ka'kab is the etymological root, the suffix is less clear in its application to the site as Barrera, in his explanation of the site name for Ka'Kabisax, Campeche, goes on to list “is” as meaning “*Ipomoea batatas*” (sweet potato) and ‘ax’ as “wart” (Barrera V. 1995: 283). Hypothesising, a possible variation of the name Ka'Kabish, Belize, as Ka'Kab'bis², then we can consider possible translations for the term ‘bis’ as either “manantial y agujero por donde mana del agua” or “carcoma y el agujero gue hizo” (Barrera V. 1995: 56). The former definition is highly possible as recent work documented two wells roughly 0.5 km south of the site (Haines, in prep.). According to local landowners, both of these wells (one now transformed in a small aguada for cattle) never diminish but maintain a constant water-level throughout the year. The second definition given for this term is intriguingly

enigmatic as the Oxford Dictionary of Archaeology in its definition of rendzina soils mentions that these soils consist of “a relatively thin soil consisting of an almost black calcareous mull humus formed entirely of worm casts.” This latter interpretation reinforces the second definition of ‘ka’kab’ discussed above.

Alternatively, the site name can be broken down into smaller constituent parts; ka’, kab, and bis. Here, ‘ka’ can be taken to mean an indicator of a possession (“cosa nuestra [Barrera V. 1995: 277]), although it seems to be more commonly referenced as “número dos, segundo, hacer algo de nuevo or nuevamente” (Barrera V. 1995: 277). The term ‘kab’, also has a variety of applications including “el mundo, pueblo, o region”, as well as “abeja or colmena” (Barrera V. 1995: 277-278). Taken together the term ‘ka’kab’ can produce a similar definition to that mentioned previously, as potentially “our village”, although if the term has a modern origin as suspected than it seems unlikely that the current population of the area would refer to a long abandoned ruin in such a relativistic manner. If however, the name can be shown to have a pre-Hispanic genesis (something currently not possible), then this term has greater applicability.

If, however, the more commonly applied meaning of the term ‘ka’ is used in conjunction with the definition of ‘kab’ as village, then the term “second village” becomes possible. This is a highly probable interpretation given that the largest ruin in the area is Lamanai, and Ka'Kabish, based on its more modest size, may well have been considered a ‘second site’ in the area. The choice of translations for ‘kab’ is made more difficult by the prolific number of Africanized Bees, and bee hives, currently resident at the site. However, this would leave unresolved the matters of a suitable prefix (although ‘new bees’ has possibilities), and suffix for the name.

Based on the various definitions provided by Barrera, the possible translations deemed most likely (and favoured by this author) include ‘second

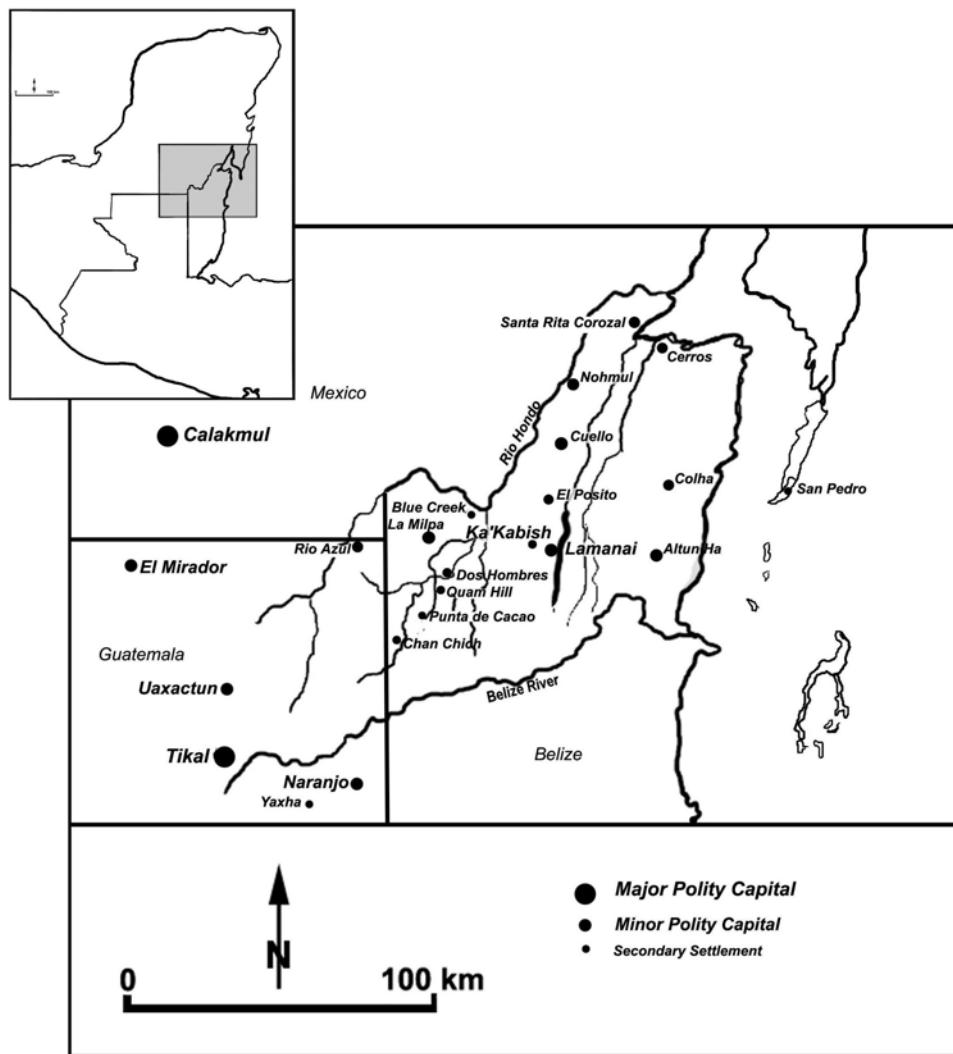


Figure 1. Map of Northern Belize.

village with springs', or 'high firm land with springs'. It should be acknowledged that the name also may be more prosaically based on a geological and geographic description of the soil and substrate, however, this seems more unlikely given its likely origin as a Maya appellation.

Location and Geographical Setting

Ka'Kabish is a modest-sized site located in northern Belize (Figure 1). It was constructed on a limestone ridge, one of several that undulate across this part of north-central Belize (Hammond 1973; Romney et al. 1959), and which may serve

as the basis for its name (see discussion above). It is roughly 10 kilometres in-land from Lamanai in a north-by-northwest direction, and it is clearly visible from the top of the High Temple.

In the latter part of the 20th century a graded, limestone/sascab road was created connecting the villages of San Felipe and Indian Church. This road, at least in regards to the portion between Ka'Kabish and Indian Church, appears to correspond to an early logging trail (Pendergast personal communication). The construction of the road directly impacted the site in two significant ways: (1) it bisected the core area

of the site into northern and southern sectors; and, (2) parts of two buildings and the south plaza were quarried for road fill before the plundering was halted. A secondary, but potentially no less significant impact of the creation of the roadway, was the increased accessibility to looters which, contrary to the efforts of the landowners is still occurring (Haines, in prep.). The majority of the looting, including some of the largest trenches, however, appears to have been conducted prior to Pendergast's and Belenger's visit to the site (see Pendergast 1991).

Using this road as a dividing point the site is broadly referred to in terms of the North Complex and the South Complexes. Although work conducted during the 2007 and 2009 seasons resulted in the renaming, and in many cases naming, of the various complexes encountered using an alphabetic system, for the purposes of general discussion the site is still referred to in terms of the Northern Half and Southern Half.

History of Archaeological Investigations

The first known visit to Ka'Kabish by an archaeologist was in the early 1980's by David Pendergast, who visited briefly while working at Lamanai. Mention of the site is included in his discussion of the illicit digging in the region (Pendergast 1991). The site had been visited earlier by the British Geographical Survey team who placed an elevation datum on the top of one of the pyramids in an out-lying plazuela group but no reference can be found to them recognizing the area as a Maya ruin.

In the mid-1990s, Ka'Kabish was visited by archaeologists from the Maya Research Program (MRP), including this author, who produced a functional, although rudimentary, map of the site core documenting the noteworthy buildings (see Guderjan 1996). At that time a total of 27 structures (divided into two areas by the modern road) were documented (Guderjan 1996). This map formed the basis for the initial investigations at Ka'Kabish and, using it as a guide, the site was assessed in

2005 for its potential for further archaeological research.

Full-scale clearing and survey work began at the site in 2007 under the aegis of the Ka'Kabish Archaeological Research Project (KARP). The results of this work were reported in the Belize Archaeological Report of 2008 (Haines 2008a) and will not be repeated here except to say that during that time five architectural groups (identified alphabetically as A to E) with a combined total of 42 structures were identified. In 2009, research focused primarily on mapping the area of the site that lies immediately to the north of the aforementioned San Felipe-Indian Church road, and resulted in the mapping of the single plaza which forms the northern portion of the core zone. At this time another 15 structures were mapped – many of which were present, albeit in slightly different configurations on the original map – bringing the total number of mapped structures to 57, more than doubling the size of the site.

Structures on the north side were classified as Group-F and investigations during the 2009 field season revealed that the architectural arrangement of these buildings, like those on the south side, is more complex than originally believed. With the removal of the underbrush the previously disparate structures coalesced into clear pattern. All of the structures mapped, with one exception, were arranged around a clear plaza with steep drop offs on the east and north-west sides. A somewhat damaged ramp on the south side of the Plaza likely served as the original point of entry to the plaza. The south-eastern portion of the plaza appeared to be torn away, probably a result of the same road construction activity that removed sections of two of the buildings on the south side (see Haines 2008a, 2008b).

The presence of a clearly defined plaza was not surprising as, not only is this fairly typical at Maya sites, we had seen it in regards to the buildings on the south side. What did come as a surprise was the discovery that the nine structures on the east

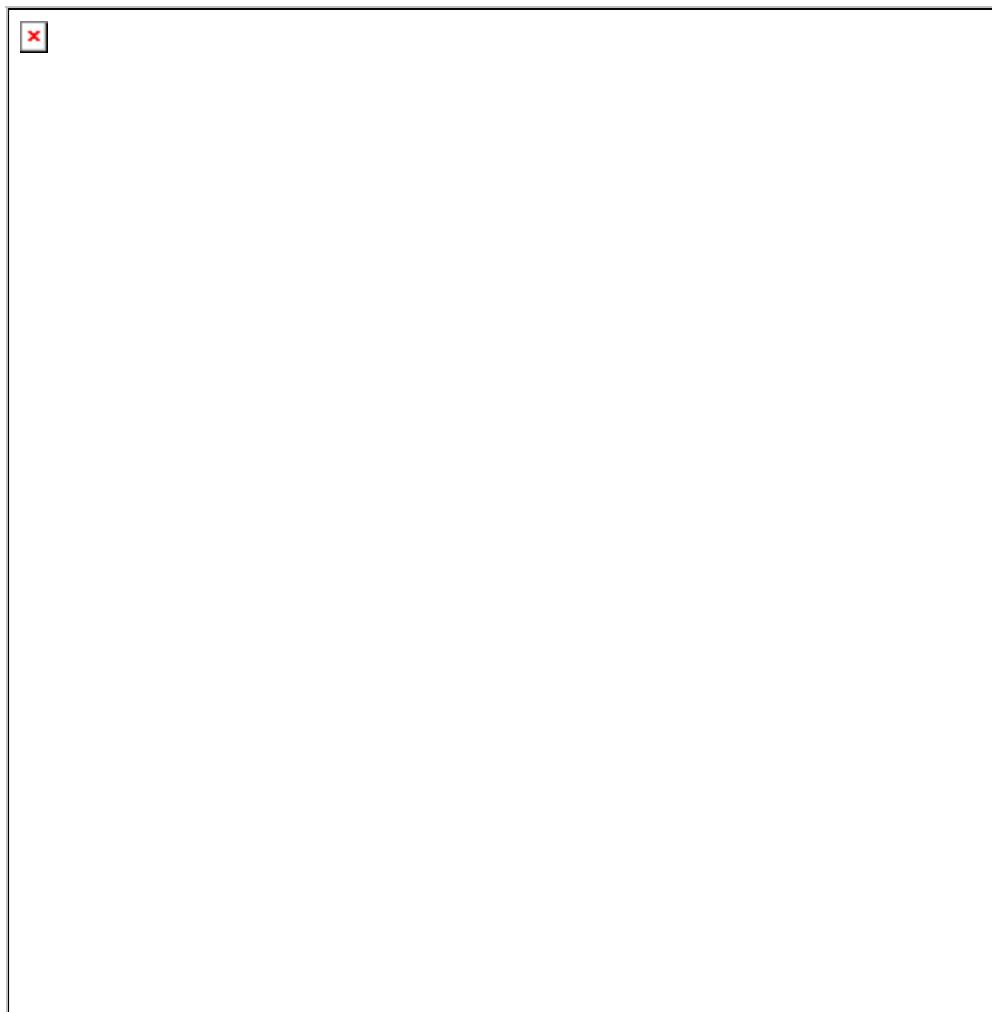


Figure 2. Map of Ka'Kabish.

side of the plaza were situated on a raised platform in an acropolis-like arrangement. A discussion of this grouping, as well as other significant structures located in Group F, will be the focus of the remainder of this paper.

Discussion of Structures

All of the structures mapped, with single exception, were determined to be associated as they were located on a single large plaza platform; consequently, all these structures were identified as belonging to Group F (Figure 2). The lone anomaly was a small, square outlying structure located in the forest to the south-east of the

acropolis. This structure may at one time have been located on the plaza surface, however, dense undergrowth and what appeared to be construction damage to the plaza, likely from the road, prevented a clear association from being made.

Group F Significant Plaza Structures

As one approaches the north group the first structures encountered are two pyramids (Structures F1 and F2 sequentially) each roughly 11 metres high. What makes these structures particularly noteworthy is that they are situated so closely to each other that they appear joined giving the outward impression of a buried Rio Bec-style temple-range building.

Guderjan reported that a looted vaulted tomb existed in each structure, however, these have yet to be re-located (Guderjan 1996:118).

These structures are located immediately to the north-west of the access ramp to the plaza; this access way channels people onto the plaza immediately to the east of these buildings. It is believed that these building were oriented in this direction as this would also face the acropolis. The western sides of these pyramids drops (albeit it negligibly) to a lower surface a scant metre below the plaza at this point. The plaza extends further to the north and west where it is ringed by three rather unremarkable, standard-looking range structures, and increasingly steeper plaza edges.

Group F – Acropolis Structures

Of greater note is the large platform that rises roughly three metres above the plaza floor and dominates the eastern side of Group F. The upper surface of this platform housed nine structures, arranged around all sides of the platform and in many cases merged with the back edges of the platform. Based on the arrangement of three temple pyramids (Structures FA-5, FA-6, and FA-8) arranged along the east side of the platform this area is currently believed to be an acropolis structure.

While these pyramidal structures exhibit certain similarities (i.e., the same east-west dimension [20 metres] and having the back of the structure merge with the edge of the acropolis forming a steep drop) they also demonstrate discrete collections of attributes that make them unique from one another. The front of the northern-most of the three pyramids (Structure FA-5) has a curved appearance suggestive of rounded corners. A rounded pyramidal structure was identified at the nearby Blue Creek Ruin (Haines 1995). Structure FA-6 appears to be a standard square temple-pyramid form and is distinct externally from its mates only in terms of its greater size. This structure, at approximately 27 metres wide and 9 metres tall, is roughly 10 metres wider and two

metres taller than each of its neighbours. The southern of the three pyramids (Structure FA-7) is also distinct in that it appears to have a small square structure abutting the front of the building. This appurtenance, which is approximately four metres lower than the main body of the pyramid, gives the structure a two-tiered effect. It is possible that this appended construction represents a later room added to the structure, similar to that found on Structure 21 at La Milpa (Hammond 2010 pers. comm.). Small structures appended to the front of temples also have been documented at Blue Creek where it appeared to have been used for ritual offerings (Driver 1999:27).

Two other structures that may also imply a ritual use for this platform are Structures FA-2 and FA-3. These structures, located in the northwest corner of the platform were discovered to be both similar in configuration (each is a rectangular structure 26 metres long) and in close, parallel proximity to each other (approximately 3 metres apart). It is speculated that these two buildings (Structures FA2 and FA3) may form a ball court. If so this would be the second court at the site, the first being found in Group D in the southern section of the site.

Structure FA-6 Tomb 1

Perhaps the most noteworthy discovery of the season resulted from the investigation of a tomb located deep inside Structure FA-6. Unfortunately, the tomb had been looted prior to its initial discovery in 1995 by the Maya Research Program. While the tomb lacked a body and mortuary offerings some valuable information could still be salvaged from the situation; in particular, valuable information about the architectural design and the potential political or social relationships of the individual(s) involved in its construction and use can still be gleaned from the remaining construction.

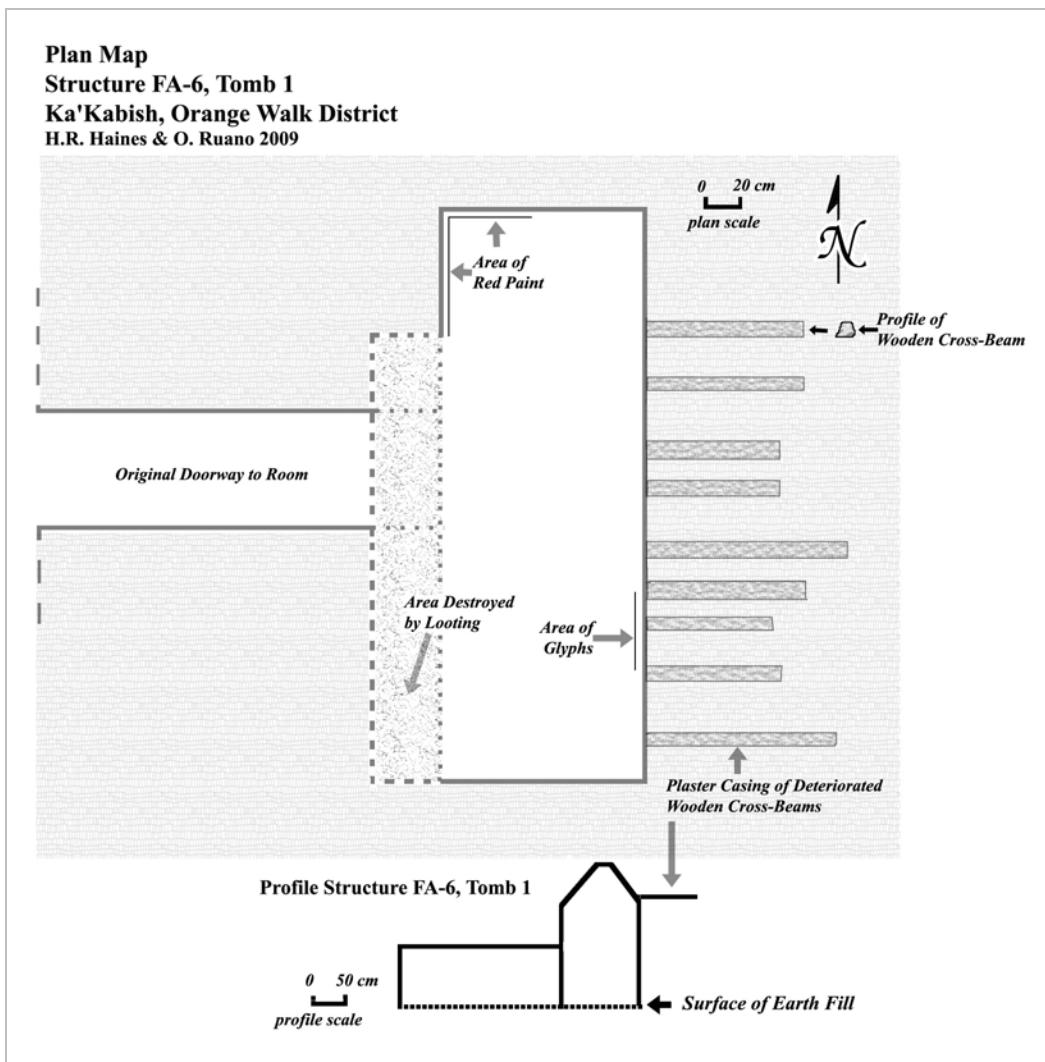


Figure 3. Plan Map of Tomb 1, FA-6.

Because it is situated on the east side of the building, the tallest in appearance due to the conjoining with the platform, the looters appear to have placed the tunnel at what they likely assumed was the mid-point of temple. In actual fact, the tunnel is quite low in the overall building configuration, entering the structure roughly at the same elevation as the current acropolis platform surface. The tunnel terminated at a small room that appears to have been used as tomb.

This room was quite spacious when compared to the previous tomb documented at Ka'Kabish (Haines 2008a). It measured roughly 3.5 metres north-south and 1.5

metres east west and was constructed with a corbelled vaulted ceiling. Several rows of voids were visible on the eastern wall of the vault. The interiors of these voids were lined with plaster, and impressions on the material indicated that they once held triangular shaped poles that have long since decayed.

To the west, opposite the looter's tunnel was a narrow passageway roughly 0.75 metres wide. The exposed portion of the tunnel was slightly less than one metre high, however, the original height of the passageway is unknown and may be considerably deeper depending on the nature and function of this passageway. The looters had continued excavating this

passageway to a distance of 2.5 metres, and only ceased their digging when the walls of the passageway ended.

The west wall of the room where the passageway connects to the room has been savagely destroyed to a depth of roughly half a metre, with portions of the wall littered around the room. Areas of the north and south walls had also been dug out, as had an area behind the west wall, suggesting that the looters may have been looking for, or removed, wall caches akin to the practice at Altun Ha in Tombs B-4/3 and B-4/4 (Pendergast 1982: 122-124, 130-136).

The floor of the room was covered in a layer of what appeared to be soft, greyish fill. When the site was visited by the Maya Research Program in 1994 numerous obsidian blades were salvaged from the surface of the room and reported as part of this author's dissertation research (Haines 2000). These blades may have come from the ceiling of the room where a filled shaft is visible. This shaft enters the room to the east of the capstones suggesting that at least some of the damage to the eastern portion of the vault was pre-Hispanic in nature.

It is speculated, based on the passageway, that the structure may be a buried room that was re-entered and used at a later date as a tomb. This would account for the presence of both an, albeit narrow, entryway as well as the shaft in the roof. While it is possible that shaft was used for tomb re-entry (or "The Fire Enters His House" ritual), this type of behaviour is not documented from this area of Belize (see Stuart 1998 for a discussion of this ritual).

Visible in the shaft are a series of layers of different materials; charred wood chunks, obsidian, chert flakes, and snail shells, between which are thin layers of dirt and plaster flecks. This layering is consistent with that found at other tombs in the Maya area (Haines 1995; Guderjan 1991; Moholy-Nagy 1994, 1997; Trik 1963; Smith 1950, 1972). Burned wood taken from this shaft produced a calibrated C14 one-sigma date range of 417AD - 533AD with an intercept age of AD 475. While this date range is considered to accurately identify the period

when the shaft was constructed it is still unclear if the shaft is associated with construction of the tomb or a possible, but yet verified, re-entry activity.

The walls of the room appear to have been coated with red painted plaster and portions of this are found on the east wall and in the north-west corner. What is of particular note is that the east wall also appears to have been painted with dark red glyphs as is indicated by the remains of three glyph blocks (Figures 4 and 5). Christophe Helmke has proposed a tentative decipherment of the glyphs, and he believes that the glyphs conform to a nominal series, and perhaps provide the name of the individual that was laid to rest in the tomb (Helmke 2010, pers. comm.). Helmke's analysis of the spelling patterns indicate that the text was probably painted sometime before A.D. 747, and although no firmer means of dating the glyphs was found, this finding does dovetail with the C14 date recovered from the fill in the tomb shaft, which corresponds to the latter part of the Early Classic.

The combination of attributes (i.e., size, high vaulting, glyphs, passageway, and possible re-entry) are currently unlike any other tomb thus far documented at Ka'Kabish or in the immediate area. The overall impression of the tomb chamber corresponds most closely with the Painted Tomb Tradition noted at Rio Azul roughly 50 kilometres to the west. This design is significantly different from the first tomb documented by KARP in Structure D-5 (Haines 2008a). This tomb (Structure D-5 Tomb 1) appears to most closely resemble the cocoon tombs documented by Pendergast at Lamanai (Pendergast 1981: 38-39). Although both appear to date to the later facet of the Early Classic period they are clearly the products of different architectural programmes. The fact that they are architecturally distinct from each other, with one exhibiting features more closely paralleling those found in tombs in polities to the west, while the other mirrors a style previously known only at Lamanai to



Figure 4. Photo of Red Painted Glyphs in Tomb 1, FA-6.



Figure 5. Illustration of Red Painted Glyphs in Tomb 1, FA-6 (courtesy of C. Helmke)

the east, only adds to the enigmas at Ka'Kabish.

Discussion

While the 2009 exploration of the north side of the site did not expand the physical dimensions of the northern complex to the

same extent that the 2007 field season had done in the south it clarified the arrangement of the structures. The 2009 work delineated the northern architectural assemblage through the identification of plaza edges and the discovery that the structures on the eastern side, rather than being a dispersed

assortment of building, were not only part of a co-ordinated group but were arranged on a clearly defined acropolis-like platform.

Previous work at the site already has raised the possibility that Ka'Kabish was not a mere secondary administrative or minor centre bound to a larger primary centre assumed to be Lamanai. The size and scope of the architecture is clearly more in keeping with ideas of polity centres – albeit in this case one with a much smaller areal extent than its more famous cousins such as La Milpa, Lamanai, or Caracol. The discovery of an acropolis-like structure complete with a series of what appear to be mortuary temples arranged along the eastern side reinforces the idea that Ka'Kabish was a site with greater socio-political presence than previously believed.

The idea of Ka'Kabish as a completely independent capital, however, is hobbled by several factors, not the least of which is its close proximity to Lamanai, suggesting we must either reassess our ideas of polity size or look for other models to explain the role Ka'Kabish may have in the ancient Maya landscape. Several hypotheses derived from current ideas about ancient Maya socio-political organization are currently being entertained: (1) it was the centre for a mobile royal court from Lamanai; (2) it was the ideological or political seat for a heterarchically arranged polity with the economic seat being Lamanai (cf. Haines 2008a); (3) it was a suburban settlement for elites who may have 'worked' at Lamanai (cf. Haines and Patterson 2008); (4) it was an autonomous polity centre. Each of these models has something to recommend it as well as something to undermine its application.

In regards to the first model: it is possible that Ka'Kabish was the centre for a mobile royal court that moved to the city during the later part of the rainy season when Lamanai becomes excessively humid and mosquito ridden. The existence of mobile royal courts has been suggested for other parts of the Maya world (Ball and Taschek 2001). This model would explain the presence of ritual and elite architectural

arrangements that replicate those at Lamanai. It would also account for the presence of large temples and monumental structures at an otherwise small site. However, if Ka'Kabish was only a "summer palace", or temporary residence, then one would not expect to find an acropolis or rich tombs such as the ones indicated by the looted recorded at Ka'Kabish. The royalty, most likely, would be buried at the primary centre, either Lamanai or a hitherto unidentified capital.

The second theory, that Ka'Kabish was the ideological or political seat for a heterarchically arranged polity with the economic seat being Lamanai, would explain the presence of both royal or high status tombs and the monumental temple/ball court architectural grammar. However, Lamanai has tombs and a temple/ball court arrangement that is not only identical in layout to that at Ka'Kabish, but it exceeds those at Ka'Kabish in terms of size. If the former site was only an economic centre in a heterarchical system then one would expect that monumental ritual architecture would be lacking, or be considerably smaller than at the ritual capital; such is clearly not the case with Ka'Kabish and Lamanai.

The idea that Ka'Kabish was an early suburban settlement is tempting (Haines and Patterson 2008). The clear correlates between the sites in terms of the material culture thus far discovered suggests a close level of interaction between the two sites. Moreover, a high-ranking elite population who lived at Ka'Kabish would explain both the elite residential structures and the tombs. However, it does not explain the presence of ritual architecture. If Lamanai was the primary centre and the population were commuting there on a regular basis then one would expect such ritually powerful activities involving monumental structures such as ball courts to be restricted to the capital.

It is also possible that Ka'Kabish was an autonomous centre with its own ruling elite and ritual activities. This would explain the monumental ceremonial architecture, elite

structures, and tombs. The high labour investment and elite ritual and residential architecture, particularly the presence of a ball court with marker, indicates that the elites at Ka'Kabish possessed many royal prerogatives. The close physical distance between Ka'Kabish and Lamanai is significantly less than what has been suggested for primary centres elsewhere in the Maya realm (Mathews 1991), and is closer to what has been suggested for causeway terminus groups (A. Chase and D. Chase 2001:274). Consequently, if Ka'Kabish was an autonomous centre then we must rethink what we have traditionally considered to be the geographic extent of polities for north-central Belize.

Another idea that was suggested to me recently by Debra Walker is that Ka'Kabish, not only corresponds to the Rio Azul tomb tradition but also may reflect its political trajectory – that of a small centre that rose to prominence rapidly during the Early Classic period before waning in the Late Classic period. This theory may be supported by the surprising discovery of a rich Late-Terminal Formative/Early Classic midden at the site coupled with a perplexing paucity of Late Classic material. While this lack of Late Classic material may be reflective of a larger political pattern, it may also reflect a sampling issue as the project has only just started excavations.

It is possible that the Ka'Kabish and Lamanai were engaged in a dynamic system that saw power shift between the two sites over time. The idea of inter-site relationships where power passed between sites within a region has been suggested previously for other area of the Maya world. The close relationship between Ka'Kabish and Lamanai cannot be discounted and is manifested perhaps most dramatically in the previously mentioned cocoon tomb.

Another possibility is that Maya polities more closely resemble city-states (see Marcus 1989, 1994; also Webster 1997); possessing a single ruling lineage situated in the sole urban centre these states would have a limited geographical or territorial extent under their immediate control. However,

this would not prevent them from creating hegemonies through the domination of other smaller city-states or polities, each with their own ruling elite.

I believe that the presence of hegemonic city-states is a political model that has not been adequately explored for the Maya area. The existence of autonomous, or semi-autonomous centres **dominated but not subjugated** by a larger or more power centre could explain the presence of elite architecture, monumental ritual constructions, and high-status tombs, as well as other indicators of royal prerogatives at smaller centres, while simultaneously accounting for close parallels in material culture between cities of disparate sizes. This model of hegemonic city-states could explain the architectural assemblage at Ka'Kabish as well as its close parallels in material cultural with that of Lamanai. Moreover, the variability found in the architectural programme and material assemblage could be accounted for if the site fell under the sway of different centres through time. It is this model, that Ka'Kabish was an autonomous centre dominated but not subjugated by Lamanai and/or other political capitals; that is currently favoured by this researcher.

Conclusions

What does this mean for Ka'Kabish in terms of status and power? Was it a leading cosmopolitan centre that attracted a series of diverse peoples? Or one that exercised power over its own polity and possibly beyond? Or was it a city that was subjected to the vagaries of the tides of political power that washed through the Maya lowlands? Status and power are not necessarily conflated and it is possible that the rulers of Ka'Kabish enjoyed a high level of social status – at least on the local level as evinced by the labour invested in creating the tombs – but that they exercised little power or influence in the grand scale of Maya politics and were instead allied to various different political factions through time.

If it seems like there are more questions than answers regarding

Ka'Kabish – it is because there are. Work at Ka'Kabish is still too new to answer these questions and our explorations of the north side have only served to make the history of Ka'Kabish more enigmatic. It is hoped that with the continued addition of new information we may one day decipher the true nature of the site of Ka'Kabish and understand the role this curious site played in the ancient socio-political landscape of North-Central Belize.

¹The term, now considered obsolete by the United States Department of Agriculture (USDA), is generally defined as soil consisting of “a brown earth soil of humid or semi-arid grassland that has developed over calcareous parent material” (Allaby 2004).

²The idea that the site name may not be as inscribed in the currently literature is a possibility given that the name appears to have been strictly oral until the 1990s when it was writing down in an English language article (Pendergast 1991).

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SECTION TWO: GENERAL RESEARCH PAPERS



12 THE PRECOCIOUS DEAD: STATUS, POWER, AND EARLY TOMBS IN THE EASTERN THREE RIVERS REGION

Brett A. Houk and Fred Valdez, Jr.

A handful of tombs dating to the transition from the Late Preclassic to the Early Classic in the eastern part of the Three Rivers region provide important information about the nature of elite expressions of status and power. Our sample includes two royal tombs, Chan Chich Tomb 2 and La Milpa Burial B11.67, and three elite tombs, Blue Creek Burial 5, Dos Hombres Structure B-16 tomb, and the Barba Group tomb. Status is reflected in the use of exotic artifacts as funerary offerings, but power is demonstrated by tomb location and labor investment. Regionally, the royal tombs are not the richest tombs, meaning that power was based on things other than personal wealth. The kings of the region relied more on the institution of divine kingship for their royal authority than they did on their control of or access to prestige goods. By the end of the Early Classic, even rural elite had access to exotic ceramics, as evidenced by the Barba Group tomb.

Introduction

In this paper, we examine data from a number of Terminal Preclassic and Early Classic tombs from the eastern portion of the Three Rivers region of the east-central Yucatán Peninsula (Figure 1). The region encompasses approximately 2,000 km² (Houk et al. 2010) and is home to over a dozen medium-to-large sized ruins, including Río Azul, La Milpa, La Honradez, San José, Dos Hombres, Chan Chich and Blue Creek (see Figure 1). Tombs provide useful datasets with which to address issues of status and power, and, in the Three Rivers region, tombs from an early period and their contents are a regional expression of an emerging pattern of elite competition in the Central Lowlands (Houk et al. 2010).

The transition from the Late Preclassic to the Early Classic in the Central Lowlands was a turbulent time of political and social changes for the Maya elite and provides a contextual framework for our discussion. Although the appearance of the institution of kingship occurred in the Lowlands sometime in the Preclassic, it was during the Late Preclassic and into the Early Classic that it proliferated. The appearance of divine kings, with true political authority, changed the dynamic of elite status and power. During this interval “emergent elites appropriated the practice of ancestor veneration and converted it to an institution that cemented the transmission of political power” (McAnany 1995:164).

Archaeologically, elite competition and the expanding institution of kingship is reflected in the adoption of royal symbols, the appearance of royal tombs, and the use of specialized assemblages of prestige artifacts in burials and caches at a handful of Central Lowland sites.

Tikal was an early and successful entrant into the political arena of the Late Preclassic, and Yax Ehb' Xook apparently founded a royal dynasty there ca. A.D. 100 (Martin 2003:5). Yax Ehb' Xook is likely the headless individual interred in Burial 85 beneath Str. 5-Sub.2-2nd (Martin 2003:5; Sharer with Traxler 2006:310). Burial 85 is not the earliest elite burial in the North Acropolis at Tikal, but certain traits signal that it represents something new. Loten (2003:238–239) notes “the radical change in architectural form and increased richness of Burial 85 might embody a more ambitious claim for dynastic legitimacy than had been made earlier.” The architectural change alluded to by Loten was the placement of the tomb beneath a specially constructed shrine platform (Coe 1990:217). The inclusion of a “fuchssite portrait head” pectoral depicting a human face wearing a “Jester God headdress” indicates that Burial 85 is a royal tomb (Schele and Freidel 1990:135). Schele and Freidel (1990:120–121) have suggested that helmet-bib head pendants, what they call diadems or “royal jewels,” are comparable indicators of royal status and were worn as part of a headband by Late

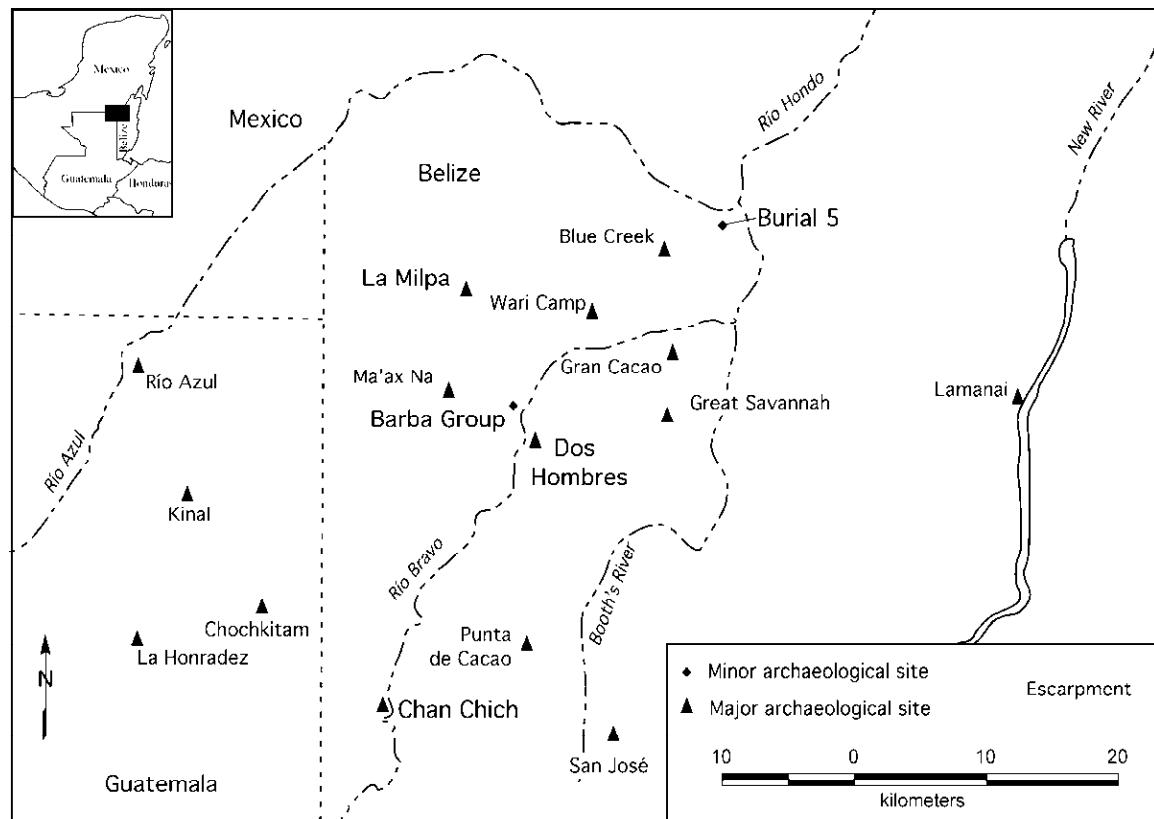


Figure 1. Map of the Three Rivers region. Sites with tombs discussed in this paper are in bold.

Preclassic kings (see also Freidel and Schele 1988:555).

At other Maya centers, elite were similarly competing with one another for status, and some were experimenting with the spreading institution of divine kingship. In this paper, we focus on three tombs from sites in the eastern portion of the Three Rivers region—Chan Chich, Dos Hombres, and the Dos Hombres periphery—but draw on data from other sites in the region including La Milpa and the Blue Creek periphery. These tombs date from Terminal Preclassic and Early Classic periods, and thus provide a picture of the evolution of elite expressions of status and power in the region.

Status is commonly defined as the “culturally prescribed rights and duties inherent in social positions, whatever their origins” (Calhoun 2002:464). Commonly, wealth and access to exotic goods are often associated with high status in preindustrial

societies. *Power*, on the other hand, is the ability of a person or group to exert control over others, even against their will, and is often related to authority, when power is accepted as legitimate, requiring no direct coercion (Calhoun 2002: 378). Therefore, a person of high status within a particularly society may or may not also have power. Prior to the appearance of divine kings and archaic states in the Lowlands, rulers enjoyed high status but had little true power; their ability to get others to do things may have been limited to coercion. Measuring status and power is subjective, and archaeologists rely on proxies like the elaboration of burials, the quality and quantity of grave goods to infer different levels of status, and the location of burials, the use of carved monuments, and the monumentality of constructions to infer how powerful individuals were in Maya society. We suggest that our sample of

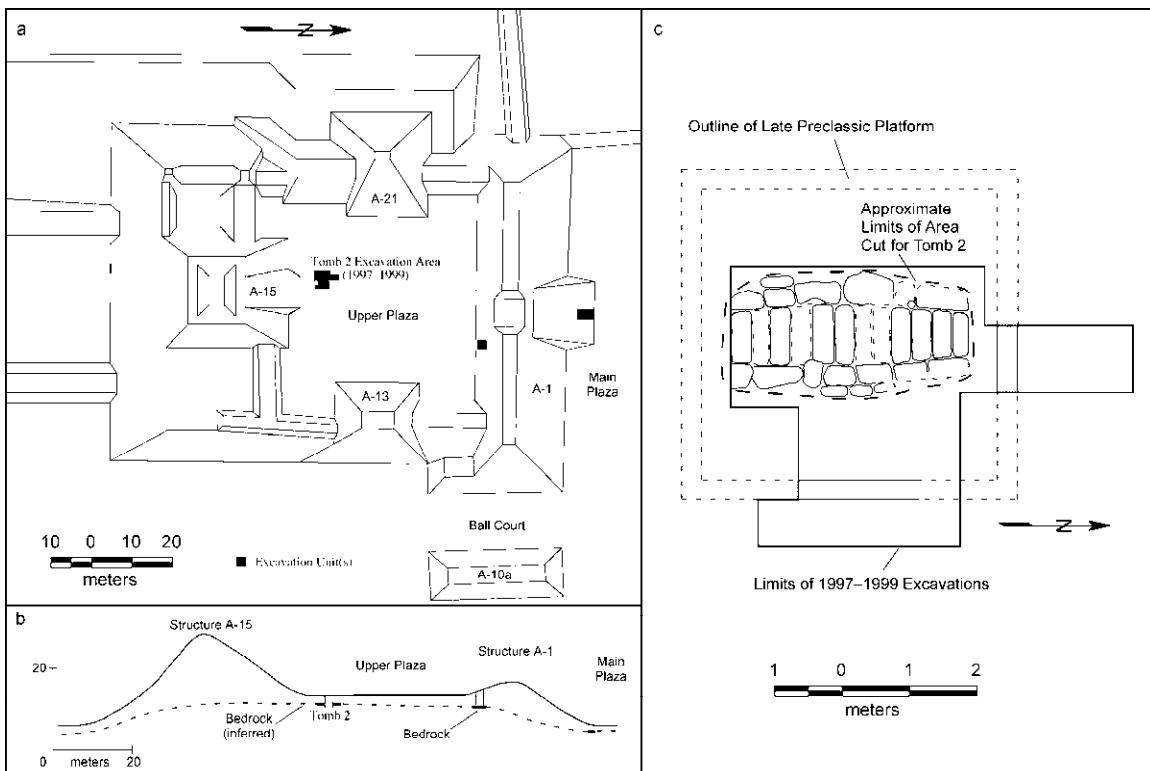


Figure 2. Maps of Chan Chich Tomb 2 excavation area: a) map of the upper plaza showing the location of Tomb 2 excavations; b) cross-section of Upper Plaza; c) map showing top of Tomb 2 chamber in relation to Late Preclassic shrine platform, which covered the tomb.

tombs shows that power and status do not always go together; the royal tombs are not the richest tombs, for example. Power, then, is clearly based on things other than wealth.

A Roster of Early Tombs in the Eastern Three Rivers Region

Blue Creek Burial 5

Blue Creek Burial 5 in the very northeastern fringe of the Three Rivers region is arguably the earliest elite burial known in the region. The burial was discovered in a chultun in an elaborate residential group on a large hill rising out of the otherwise flat floodplain shared by the Río Hondo and Río Bravo, approximately 4.25 km east of the site of Blue Creek (see Figure 1). The burial included the remains of three individuals; 28 whole ceramic vessels; over 100 pieces of jade; an assortment of obsidian, hematite, and cloth fragments; as

well as faunal and floral remains (Kosakowsky and Lohse 2003).

The 28 ceramic vessels belong to the Terminal Preclassic Linda Vista Ceramic Complex at Blue Creek (Kosakowsky and Lohse 2003). Sagebiel (2005:723) observes that Burial 5 "contained bowls, dishes, and jars (including one spouted jar) that either lack supports or have small supports that are [protoclassic] Facet 1 diagnostics." Brady et al. (1998:18, 33) suggest a range of 75 ± 25 B.C. to A.D. 150 for Facet 1.

Chan Chich Tomb 2

Tomb 2 at Chan Chich was discovered during the 1997 season of the Chan Chich Archaeological Project (CCAP) in the Upper Plaza at the site (Figure 2). The Upper Plaza, where the earliest evidence for occupation at the site during the Middle Preclassic period is located, underwent at least three and possibly four renovations during the Late Preclassic, each accompanied by a new and

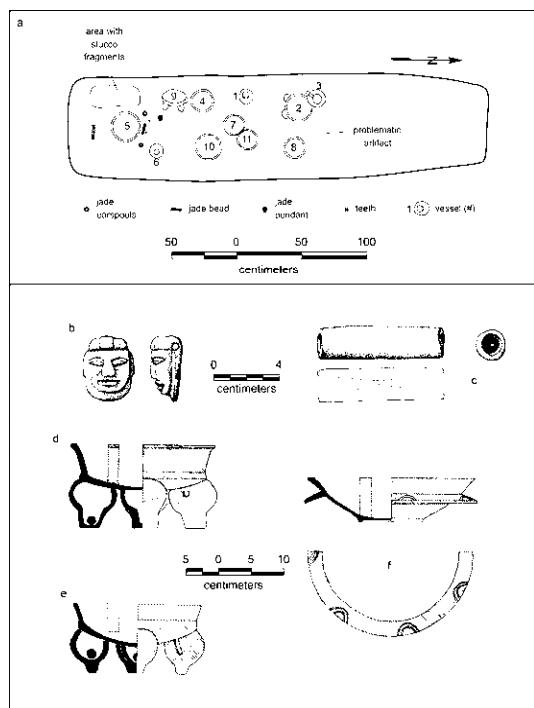


Figure 3. Plan map of Tomb 2 and selected artifacts: a) plan map of tomb floor; b) jade helmet-bib pendant; c) jade bead; d–e) Vessels 2 and 9, Sierra Red: Unspecified variety; f) Vessel 5, Laguna Seca Incised: Unspecified variety. Artifact illustrations by Ashlyn Hoffman.

higher plaza floor. Near the end of the Terminal Preclassic, the occupants of the site excavated a pit through four Late Preclassic floors and 1.15 m into the limestone bedrock beneath to create Tomb 2. The tomb's chamber was elliptical in plan, measuring approximately 3.25 m long and 0.8 m wide, and was roofed with 12 large capstones that were plastered into place to span the width of the tomb. After the tomb was capped, the shaft was filled with dry-laid cobbles, and a low shrine platform, measuring approximately 25 cm high, was built over the tomb. During the Late Classic, as part of the final major renovation of the Upper Plaza, the shrine was entirely buried (Houk et al. 2010).

Tomb 2 contained the poorly preserved remains of an adult male, 30–45 years old, who was interred in an extended, supine position, with his head to the south (Robichaux 1998). Julie Saul's (personal communication 1998) analysis suggests that the skeleton was still articulated at the time

of burial and was interred on a low, perishable litter that was placed above the vessels on the tomb's floor.

The tomb contained 11 ceramic vessels, including five mammiform tetrapod support bowls (one of which was missing its supports), two spout-and-bridge jars, two basal flange bowls, a ring base jar, and a basal angle bowl (Figure 3). The ceramic types include those traditionally associated with the Chicanel Sphere, including Sierra Red and Matamore Dichrome, and perhaps the early Tzakol Sphere, such as Rio Bravo Red (e.g., Sagebiel 2005:247–253; Sullivan and Valdez 2006:79), Laguna Seca Incised, Mango Incised, and Cashew Red-and-Buff (Valdez and Houk 2000:130). The Laguna Seca Incised vessel is a basal flange bowl with a Sierra Red slip, highlighting the nature of the assemblage (Houk et al. 2010).

The tomb contained two jade ear spools, one tubular jade bead, and a jade helmet-bib pendant (Figure 3), an artifact type that Freidel and Schele (1988) believe symbolizes royalty. The other artifacts in the tomb were fragmentary and poorly preserved. They included a fragment of *Gossypium* cotton paper, the remains of a stuccoed gourd, and a possible wooden staff (Houk et al. 2010). Houk et al. (2010) estimate a Terminal Preclassic/early Early Classic age for the tomb's construction, ca. A.D. 200 to 350, based stratigraphy and the artifact assemblage.

Dos Hombres Structure B-16 Tomb

In 1997, the Programme for Belize Archaeological Project (PfBAP) excavated an Early Classic tomb beneath a cut in the floor of an elite residential structure near the main plaza and ball court at Dos Hombres (Durst 1998; Robichaux and Durst 1999; Sullivan and Sagebiel 2003). The tomb's chamber was capped by over 23,000 artifacts of obsidian, including blades, flakes, and cores (Robichaux and Durst 1999). In addition to the skeletal remains of a single adult, the tomb contained 11 *Spondylus* shells, two greenstone earspools, several hematite mirror fragments, and nine ceramic vessels (Sullivan and Sagebiel

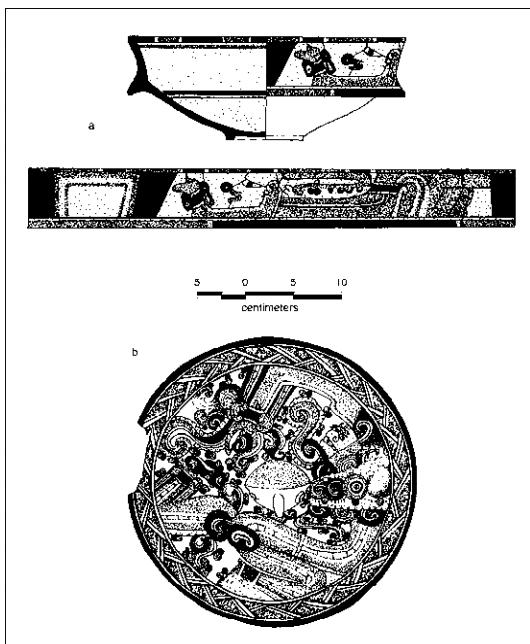


Figure 4. Ceramics from Dos Hombres Structure B-16 Tomb: a) Dos Arroyos Orange Polychrome basal flange bowl; b) Yaloche Cream Polychrome scutate lid. Illustrations by Ashlyn Hoffman, after Sullivan and Sagebiel (2003:Fig. 3.2 and Fig. 3.3).

2003:29). Among the ceramics was a Dos Arroyos Orange Polychrome basal flange bowl (Figure 4a) with a Yaloche Cream Polychrome scutate lid (Figure 4b), which place the tomb in the TR-Tzakol 2 Ceramic Complex (Tzakol 2 Ceramic Sphere) of the Early Classic, ca. A.D. 350–500 (Lauren Sullivan, personal communication 2008; see also Sullivan and Sagebiel 2003:29). Sullivan and Sagebiel (2003:29) note similarities between the decorations on the polychrome bowl with vessels and/or sherds recovered at Uaxactun, Chan Chich, and San José (Robichaux and Durst 1999). The macaw-head handle of the lid is very similar to a handle from Uaxactun, as well (Sullivan and Sagebiel 1003:29).

La Milpa, Burial B11.67

In 1996, the La Milpa Archaeological Project (LaMAP) excavated an Early Classic tomb in the Great Plaza at La Milpa near Structure 1 (Hammond et al. 1996; Sagebiel 2005; Sullivan and Sagebiel 2003). The chamber may have originally been a *chultun*, which was modified to include a

vaulted ceiling. The chamber's shaft had been filled to plaza level with alternating layers of chert and limestone slabs. As was the case with Chan Chich Tomb 2, the tomb contained the remains of a single adult male (35–50 years old) apparently interred on a wooden litter with ceramic offerings placed below (Hammond et al. 1996:89). The five ceramics included a Paradero Fluted Teotihuacán-style tripod cylinder and a scutate lid, which did not fit the cylinder. Sagebiel (2005) places the assemblage in La Milpa's Gentle Work Ceramic Complex (Tzakol 3 Ceramic Sphere), dating to the Early Classic (ca. A.D. 450–600). Other grave goods included a decayed stuccoed gourd, jade and *Spondylus* shell beads, a jade vulture diadem, and two gray obsidian earspools (Hammond et al. 1996:89–90). Based on the tomb's contents and the labor invested in the tomb's construction, Hammond et al. (1996:90) conclude that the tomb is a royal burial.

Barba Group Tomb (Dos Hombres Periphery)

A small Early Classic tomb was excavated at a residential group 2.5 km northwest of Dos Hombres (Hageman 2004:353, 374). The courtyard, nicknamed the Barba Group, is located along the edge of the Rio Bravo Escarpment and included a small, 2.5 m high, shrine on its eastern side. Although the shrine's last construction dates to the Late Classic (ca. A.D. 700–850), the ceramics from the small tomb below the shrine are Early Classic, ca. A.D. 450–550 (Sullivan and Sagebiel 2003:29).

The burial was below the center of the shrine structure, in a "small roofed chamber carved out of the bedrock" (Hageman 2004:353). The burial, shown in Figure 5a, contained the remains of a single male, over 50 years in age, who was interred with five ceramic vessels, two shell beads, and one jade bead (Hageman 2004:374). The ceramics (Figure 5b) included a Teotihuacan-style cylinder with matching lid, the handle of which was in the shape of a human head, a small cup, and three effigy vessels (Hageman 2004:374; Sullivan and

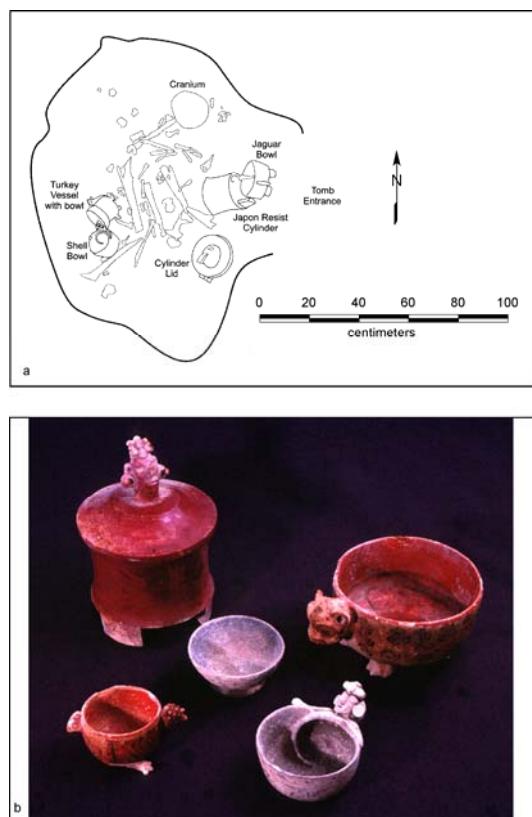


Figure 5. Barba Group tomb: a) plan map of tomb after Hageman (2004:Figure 12); b) ceramics from tomb, after Hageman (2004:Figure 13).

Sagebiel 2003:29). The effigy vessels include a shell-shaped vessel of an old human male head and arms on the rim, a zoomorphic jaguar bowl, and a stylized ocellated turkey bowl (Sullivan and Sagebiel 2003:29–30).

Discussion

At what point does status translate into power, and how can we as archaeologists recognize differences between the two? Without hieroglyphic texts to answer these questions for us, we have to rely on context, association, and inference. Fortunately, the mortuary data summarized here yield themselves to such interpretations. This small sample of early tombs provides a glimpse into the ways in which power and status were expressed by emerging royalty and the elite in the eastern Three Rivers region during the transition from the Preclassic to Classic periods.

The earliest burial in the sample is Burial 5 from the Blue Creek periphery, and the large assemblage of Terminal Preclassic ceramic vessels and other artifacts suggests the principal individual in the chamber enjoyed a position of high status in life. This status, however, did not translate into power. The tomb is located in a rural area, and the labor investment to transform an existing chultun into a tomb was minor.

Chan Chich Tomb 2, on the other hand, expresses both high status and power (or authority). Status is apparent in the assemblage of protoclassic ceramics that the elite used as status markers to express their participation in the regional political arena. The expressions of power in the case of Tomb 2 include its placement in the core of the site, situated beneath a small plaza oriented shrine—this practice mirrors some of the earliest tombs in Tikal’s North Acropolis, including the tomb of the dynastic founder (see Houk et al. 2010). Additionally, the helmet-bib head pendant from Chan Chich Tomb 2 signals that the occupant was an early king (Houk et al. 2010). Therefore, Tomb 2 conveys both elite/royal status and power in its location and artifact assemblage, and enjoys the distinction of being the earliest royal tomb known from the Three Rivers region (Houk et al. 2010).

As the region moved into the Early Classic, tombs remained effective ways of displaying status and power, but some of the symbols changed. New status markers (Early Classic polychromes, lidded Teotihuacan-style tripod cylinders, and effigy vessels) replaced protoclassic ceramics, but the location of tombs and the labor invested in their construction still provide measures of power. For example, the Dos Hombres Structure B-16 tomb, with its fancy polychrome ceramics and its cap of over 23,000 obsidian artifacts, is arguably richer than La Milpa Burial B11.67, which had a mismatched tripod cylinder and lid, however elite status does not necessarily convey power. The Dos Hombres individual was interred in a small courtyard group near the ball court, while the La Milpa individual

was buried in the main plaza at what was possibly the largest site in the eastern Three Rivers region at the time.

The rural elite were still active participants in the elite competition for status, and it is likely that access to symbols of status actually was more widespread near the end of the Early Classic. The rather simple burial at the Barba Group, in the Dos Hombres periphery, is an example of the ability of rural elite to tap into the flow of certain prestige items.

Conclusions

This sample of tombs from the Terminal Preclassic and Early Classic in the eastern Three Rivers region shows the participation of the local elite in the dynamic social and political arena of the Central Lowlands. The precocious dead at Chan Chich and the Blue Creek periphery are examples of how the elite displayed royal power versus elite status, respectively, at the dawn of the divine kings in the Lowlands. The Early Classic tombs in the sample show that access to status markers did not translate into power: the Dos Hombres Structure B-16 tomb was clearly richer than the rather impoverished royal tomb at La Milpa, but the latter's location and its vulture diadem suggest its occupant was the more powerful individual. The sources of royal power were not solely related to personal wealth, but must have been more deeply institutionalized in the system of divine kingship. By the end of the Early Classic, even rural elite had access to exotic ceramics, as evidenced by the Barba Group tomb.

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Hombres, and Barba Group tombs, John Jones analyzed a number of special samples from the Chan Chich tomb, and Lauren Sullivan contributed to the analysis of ceramics from the Dos Hombres and Barba Group tombs. We would also like to thank the excavators and analysts associated with the tombs who have shared their ideas, photographs, and notes, particularly Hubert Robichaux, Jeffrey Durst, Rissa Trachman, Jon Hageman, Kerry Sagebiel, Laura Kosakowsky, and Norman Hammond.

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13 A PRELIMINARY AMS RADIOCARBON GUIDED CHRONOLOGY FOR THE DEVELOPMENT OF THE UXBENKÁ POLITY IN SOUTHERN BELIZE

Keith M. Prufer, Douglas J. Kennett and Brendan J. Culleton

In this paper we provide a chronological overview of the emergence and growth of the small Classic Period Maya polity of Uxbenká located in the Toledo District of Southern Belize. Our research is based on seven years of fieldwork focused on understanding both the emergence of hierarchical sociopolitical organization that characterize this polity and the socio-ecological context for these developments. During its growth, Uxbenká underwent a transformation from a small farming community to a complex polity with most of the trappings of elite authority that characterizes other Classic Maya centers. The polity appears to be founded upon an earlier agricultural community that was established by at least 100 BC. Starting after AD 200 the location of the original agricultural village (Group A) was leveled to create the civic-ceremonial core of the Early Classic polity. The Early Classic was a time of fluorescence for Uxbenká's leadership, and the site appears to be the only regional center in southern Belize until after AD 500. With the arrival of the Late Classic, and the emergence of powerful neighboring communities, Uxbenká underwent another major reorganization, shifting its political center to a new architectural group (Group B. But by the 9th century the site was in decline.

Introduction

This paper reports on and presents a preliminary AMS radiocarbon guided chronology for the site of Uxbenká in southern Belize (Figure 1). Until recently most regional settlement chronologies relied on architectural styles (e.g., presence of ballcourts), epigraphic data, and to a lesser extent comparison of ceramics with other regions of the Maya Lowlands (e.g. Dunham 1996; Leventhal 1990, 1992; Hammond 1975). In general, these studies indicate that the number of polities and density of settlements were highest during the Late Classic. Our data indicate that Uxbenká (Figure 2) experienced major growth during the two periods: the transitional Late Preclassic-Early Classic and again at the beginning of the Late Classic.

Despite a century of research, southern Belize remains one of the least understood regions of the Maya Lowlands. This may be in part due to its relative inaccessibility. Colloquially referred to in Belize as the “forgotten district”, it remained reachable only by boat or foot until the late 1960s. The region is geographically circumscribed by the Maya Mountains to the west, swampy river basins to the south, the Caribbean Sea to the east, and inhospitable pine-barrens to the north. At the time when

it was settled Uxbenká was positioned in a geopolitically marginal region. Through time the site found itself situated near trade routes connecting larger polities, including Tikal, Copán, and Caracol.

Regional Background

Southern Belize is located in a geographic and cultural frontier of the Maya Lowlands. Like other Maya frontiers (Henderson 1992), it was likely both peripheral to, yet connected with the cultural and political developments occurring in larger and more economically and politically powerful centers (Schortman and Urban 1994). During southern Belize's apogee between AD 400-900 its polities were involved in significant economic interactions, facilitated by a range of mineral and biotic resources (Abramiuk and Meurer 2006; Dunham 1996; Dunham and Prufer 1997; Graham 1987), exceedingly productive agricultural lands (Prufer 2005; Wright et al. 1959), and easily traversable coastal (McKillop 2005) and inland (Hammond 1978) trade routes that provided access from the Caribbean Sea to the southern and western Petén. Archaeological and epigraphic studies suggest that polities in southern Belize may have been linked politically and economically with Copan and

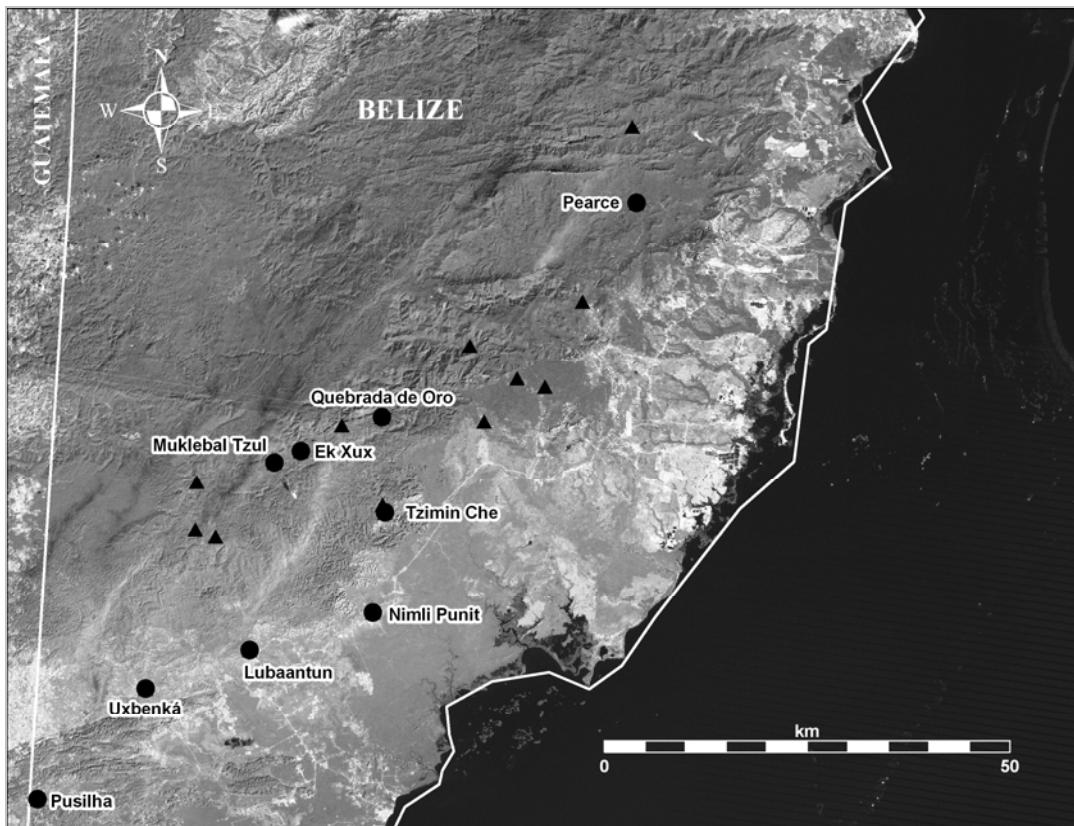


Figure 1: Surface hillshade showing locations of primary centers in southern Belize. Circles represent larger centers while triangles are smaller centers with public architecture (map by C. Ebert, J. Bartruff, K. Prufer, D. Kennett).

Quirigua (Braswell et al. 2005: 220; Grube et al. 1999; Marcus 1992, 2003:95), Tikal (Leventhal 1992: 152; Prufer 2005; Wanyerka 2005), the western Petén (Bill and Braswell 2005; Prufer et al. 2006), the southeastern Petén (Prufer 2005) and the Belize Valley (Braswell et al. 2005: 226; Prufer 2002: 180).

In regions adjacent to southern Belize, Elizabeth Graham (1994) found evidence of pre-AD 600 settlements along the coastal plain in the Stann Creek District, 80km to the north, though this area is separated from southern Belize by a series of inhospitable Pine Savannahs. Most of the occupation of the Stann Creek region is Late and Terminal Classic, and little is known about the numerous sites in the region beyond the broadest temporal sketch. Some, such as Pamona, Mayflower, and Kendal are located along rivers seasonally navigable by canoe, and have been suggested to be nodes

in riverine site hierarchies (Graham 1994: 320), or formed through expanding kin or other social networks. Coastal sites may have been simple subsistence villages that also engaged in procurement of marine and estuarine resources (Graham 1994: 316) or, in some cases, mediated maritime trade networks (McKillop 2005). Along the coast of southern Belize, McKillop (1996: 56) recovered a Protoclassic mamiform vessel from a Preclassic shell mound (ca. AD 100) and radiocarbon dated Early Classic settlements on Wild Cane Caye, indicating established maritime communities by AD 300. However, two decades of work by McKillop (2005, 2006) strongly suggest mercantile seafaring was largely a post AD 500 phenomena, further underscoring the relatively late timeframe for most regional development. Along the coast settlements and trade routes remain robust into the Postclassic, a trend not seen in the interior.

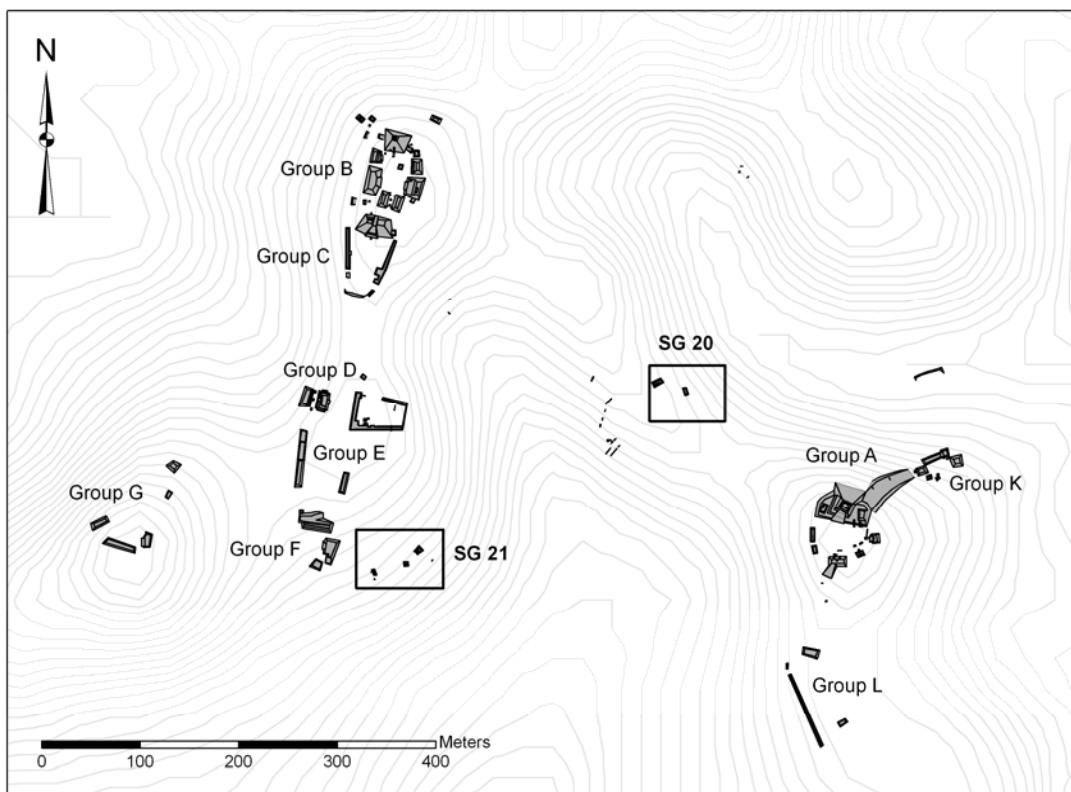


Figure 2: Map of Uxbenká showing core areas and settlements discussed in the text.

Dating Occupations at Uxbenká

At Uxbenká excavations have focused on chronology-building and the identification of the early components at the site (Figure 2), primarily in the Stela Plaza (Group A), the North Group (Group B), and settlement complexes near the site core. Group A is the location of three pre-AD 500 stela, while Group B contains Late Classic architecture, including a ballcourt complex. In the following section we report on our efforts to develop a reliable chronology for Uxbenká.

Excavations in Group A, the Stela Plaza (Figure 3, Table 1), have produced radiocarbon dates as early as cal AD 73-211 (UCIAMS-42825). Some of the earliest dates come from surfaces associated with three low earthen and plaster surfaced mounds that lack masonry stone construction and that were buried under later constructions.

Group A underwent significant modification between the Late Preclassic and the Early Classic. Excavations in the plaza reveal that what was once an uneven and likely conically-shaped hilltop was significantly modified to create the flat open stela plaza. The central, southwestern, and northern portions of the plaza have shallow fill, ranging from 15-50cm in depth. The eastern and southern edges of the plaza are built on over 3.5m of fill that expanded and leveled the plaza floor. Modification of bedrock was evident in excavations of a 1x5m trench that revealed two thick (>15cm) plaster floors sitting on bedrock.

The early buildings in Group A may have been situated around the perimeter of the hilltop that was eventually modified into the stela plaza. In Str. A-5 constructions using cut stone blocks date to after cal AD 300, based on profiles from looters' (Op. 06-6). A carbon sample removed from between the early plaster floor capping a dirt

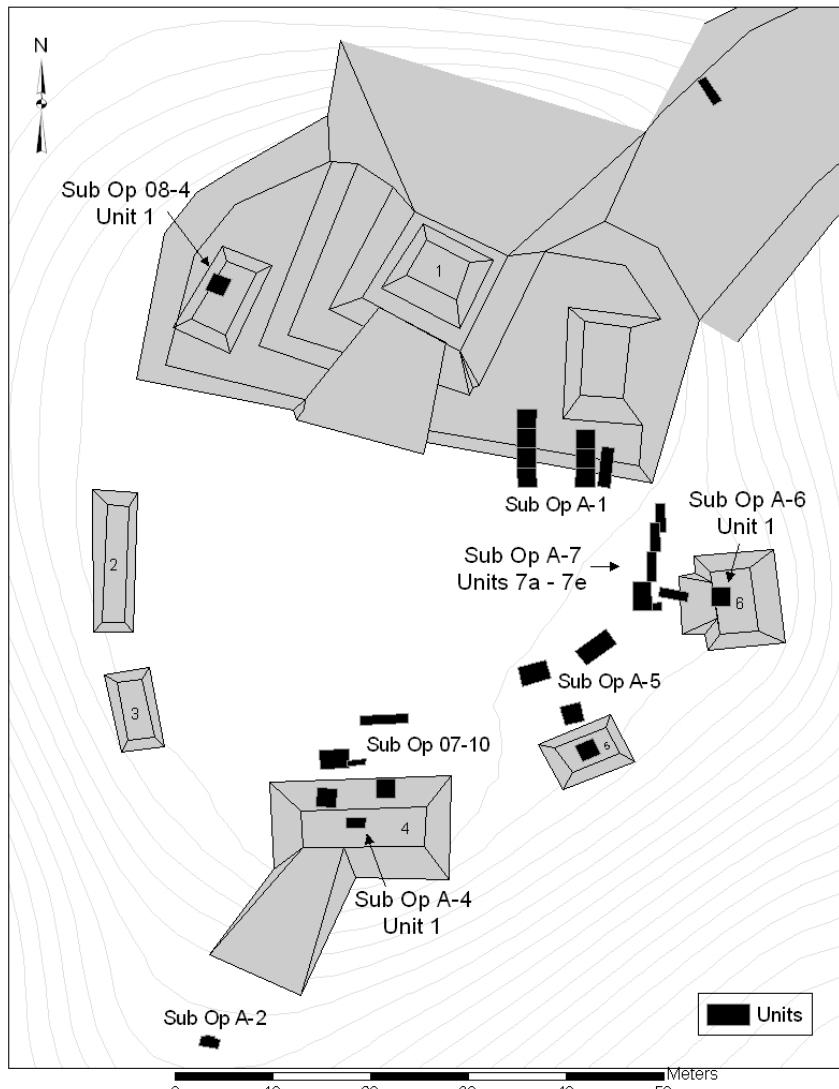


Figure 3: Group A Stela Plaza showing locations of on- and off-structure excavations and the original locations of carved stela.

platform and masonry construction blocks dated to cal AD 348-532 (UCIAMS-33401). This single date is consistent with two others from a test unit excavated adjacent to Str. A-5 (Op. 06-5) where charcoal samples from stratigraphic layers between plaster floors produced two dates. The first (UCIAMS-33403) dates to between cal AD 250-392 and the second (UCIAMS-33404) cal AD 142-337. These dates all support the presence of an earlier dirt platform or floor below the stone constructions. In the upper levels of this unit diagnostic basal flange

ceramics were recovered, indicative of an Early Classic occupation.

Another indication that the Late Preclassic/Early Classic transition was a time of significant site reorganization and landscape modification comes from a 17m-long trench excavated in front (west) of Str. A-6 in 2006 (Op. 06-7a-f). This excavation revealed a low, 1-2 course sandstone wall seemingly unassociated with any extant architecture. An AMS date from the base of this wall suggests it was constructed sometime between cal AD 136-324 (UCIAMS-33400). This wall parallels but is

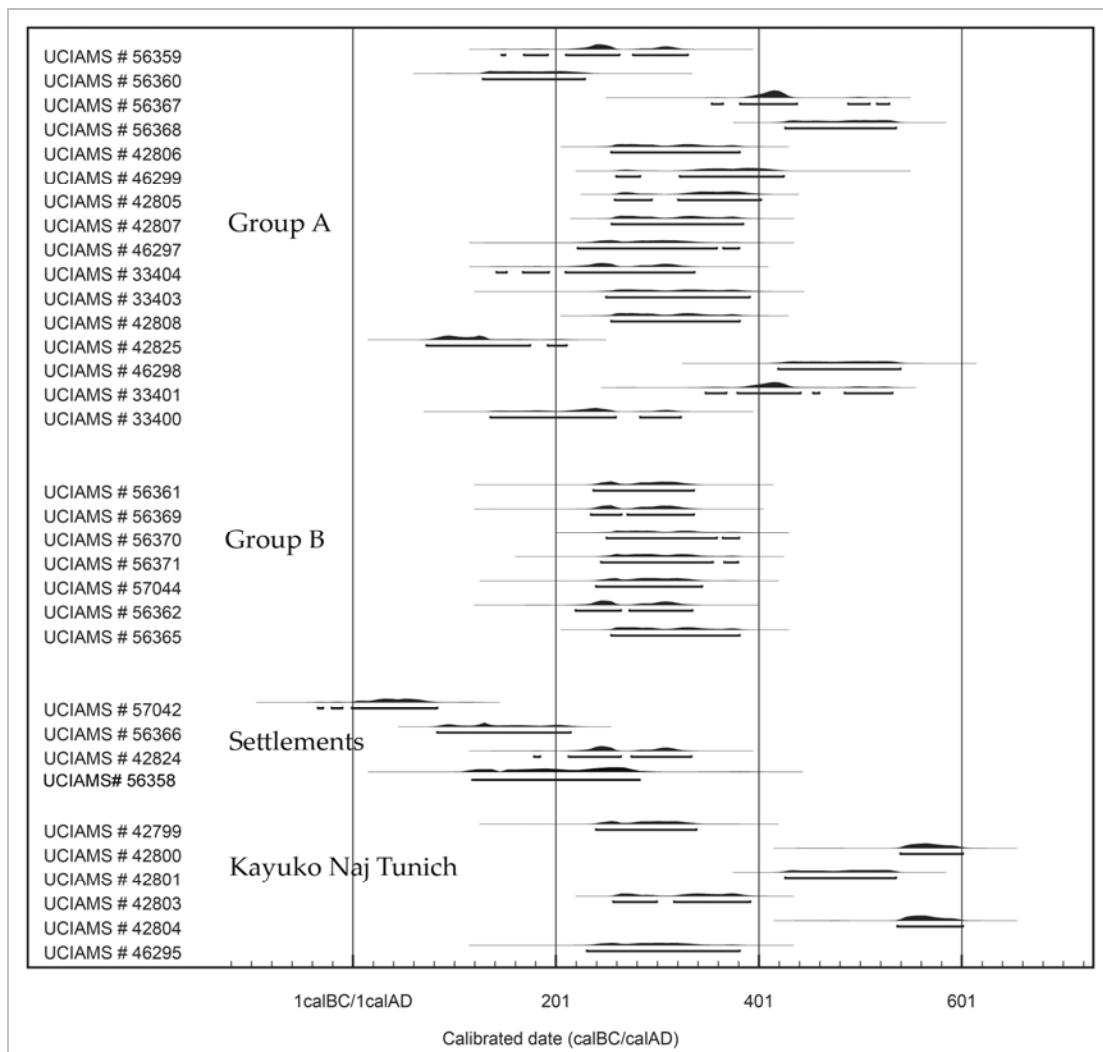


Table 1: Plot of AMS radiocarbon dates from Uxbenká.

located below the western edge of Str. A-6. In addition to the wall, several large flat sandstone pavers were found directly on leveled bedrock, suggesting the presence of an early floor.

Architectural excavations in Group A also produced pre-AD 250 dates and artifacts. These excavations suggest that (a) the earliest buildings at Uxbenká, identifiable only by the remnants of plastered floors appear between AD 75-350, and most likely between AD 75-200; (b) the earliest buildings lacked any significant stone or masonry in their construction; (c) stone sub- and superstructures likely appear after AD 350; and, (d) most of these Early Classic buildings show no evidence of any

significant architectural remodeling (though they were frequently re-plastered).

Excavation and dating of targeted contexts in Group B (Figure 4) produced a somewhat later chronology than Group A with no evidence of Preclassic dirt platforms below later constructions. All of the extant structures appear to be post-AD 500 constructions. These include a temple (Str. B-1), ballcourt (Strs. B-6 and B-7) and three patio structures (Strs. B-3, B-5, and B-11). Excavations of the front stairway of Str. B-1 (Op 08-8) produced a Late Classic assemblage consistent with elite ritual use. Artifacts include numerous effigy censer fragments and polychrome ceramics, suggesting the stairway was an area of ritual

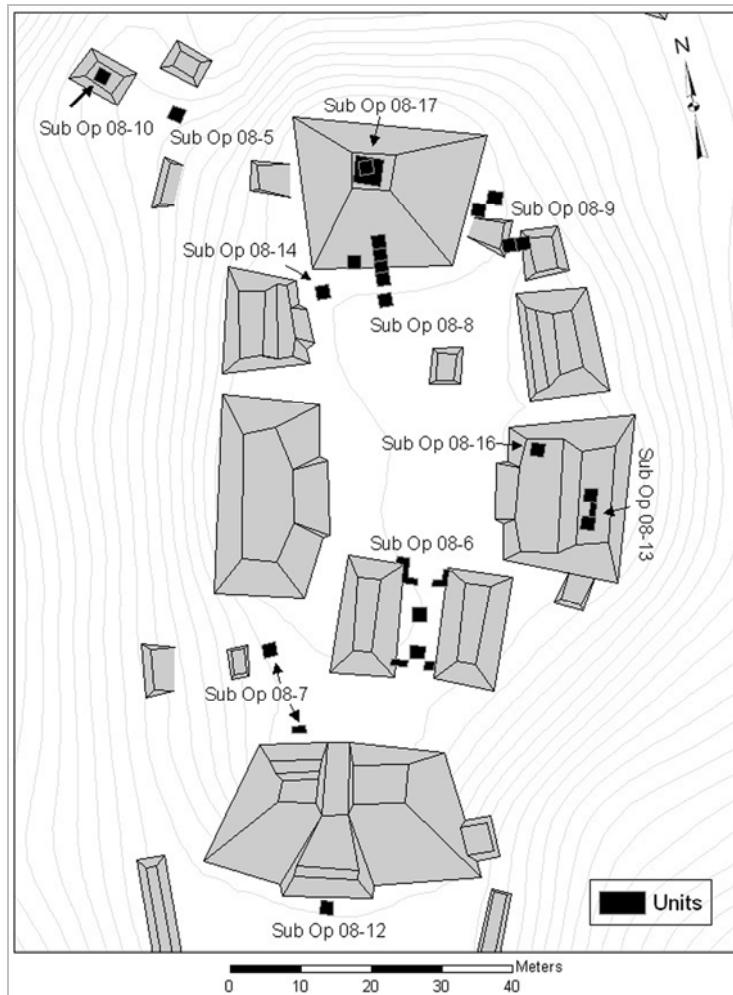


Figure 4: Group B Plaza showing locations of on- and off-structure excavations.

activity. A single AMS assay from under a slumped step produced a date of cal AD 658-766 (UCIAMS-56364).

Group B does appear to have a significant Early Classic component, though much of it was buried during a later site reorganization during the beginning of the Late Classic Period. Excavations placed between Strs. B-2 and B-3 (Subop 08-9) uncovered a section of a 1.6m high masonry building or wall buried below the visible structures. A single radiocarbon assay from the base of the wall dated to cal AD 220-335 (UCIAMS-56362), suggesting monumental construction in Group B consistent with the Early Classic reorganization of Group A.

Further evidence of a massive Early Classic reorganization of Group B comes

from excavations in front of Str. B-9, a low platform on the southwestern edge of Group B (Op 08-7). These revealed at least three Early Classic construction phases marked by plaster floors and partially intact construction blocks. At the base of the unit, 2m below the surface, large cut limestone and sandstone blocks were encountered on bedrock, apparently transported there to level the naturally northwest sloping mudstone hill. Five calibrated dates from this excavation suggest that modification of the hilltop and construction of the Early Classic surface was carried out between AD 238-381 (UCIAMS-56361, -56369, -56370, -56371, -57044).

We also have limited data on early settlements on hilltops adjacent to Groups A

and B (Figure 1). Excavations in a small residential group (SG21) recovered charcoal accompanying a crypt burial that dated to cal AD 179-334 (UCIAMS-42824). The simple crypt was in a dirt mound faced with a single course of stone and contained simple ceramic grave goods with degraded waxy reddish slips. This same settlement group was also occupied during the seventh century based on dates from a burial in an adjacent residential structure (cal AD 680-772, UCIAMS-42811) and a midden (cal AD 646-672, UCIAMS-42810).

A 6x3m excavation on a hilltop between Group A and Group B (SG20, Figure 2) uncovered the remains of an early residential compound buried under 1.3m of unconsolidated crushed mudstone fill that covered the entire hilltop. At 1.3m below the modern surface a thin plaster floor was documented in plan and profile covering a small badly decomposed dirt mound. At the base of the mound the partial remains of a small Late Preclassic Chicanel complex Sierra Red jar were found under a rock, possibly a cache commemorating the building (see Rosenwig and Kennett 2008 for a similar example). Residue from inside the vessel produced two dates of cal BC 35-84 cal AD (UCIAMS-57042) and cal AD 135-244 (UCIAMS-56358). Charcoal from sediments directly below the cache dated to cal AD 84-215 (UCIAMS-56366).

These dates suggest that the building was abandoned and covered with fill no earlier than AD 134. We interpret this as being the remains of a Preclassic structure that was buried during the reorganization of the site. The presence of landscape modification outside the core architectural groups may be an indication that these reorganizations resulted in other early buildings being abandoned and effectively erased from the site core area, underscoring the difficulty of determining how this early settlement was organized.

Discussion

The early communities closest to Uxbenká were in the southeastern Petén (Guatemala), positioned along the western

foothills of the Maya Mountains. Most of these settlements post-date AD 600, though there were earlier Preclassic occupations at Sacul, Ixkun, Xutilha, and Ixtonton in the Dolores area (Laporte 1994, 2001, 2001; Laporte and Ramos 1998). Throughout the watersheds that drain the western Maya Mountains of Guatemala, including the Ríos Machaquila, San Luis, and Pusilhá, there is continuity between the Preclassic and Early Classic at many locations, marked by what Laporte calls the “*Peripheral Chicanal*” sphere (2001: 17), defined by the continuation of Preclassic ceramic types well into the Early Classic period. LaPorte has suggested an AD 100 to AD 600 geopolitical landscape of competing rural elites autonomous from the larger central Petén polities (LaPorte 1996b, LaPorte and Ramos 1998). Overall, the southeastern Petén, like southern Belize, was most densely populated during the Late and Terminal Classic periods, and evidence for Early Classic occupations is ephemeral (Laporte 2001).

The only other Preclassic or Early Classic complex polity in the region is Ek Xux, located in the interior of the eastern Maya Mountains along the Bladen Branch of the Monkey River which is home to a number of sites that have been mapped, but are generally poorly understood (Dunham and Prufer 1998). Nine sites with public architecture are known in the eastern flank of the Maya mountains, but excavation data only exists for Ek Xux and Muklebal Tzul, both located in adjacent valleys near the headwaters of the Bladen Branch. These suggest that Ek Xux was settled in a small alluvial valley during the Late Preclassic and persisted as a relatively small community for at least four centuries. Muklebal Tzul, located on a series of high ridges 3km to the west of Ek Xux, appeared rather suddenly on the landscape after AD 600 and quickly eclipsed its small neighbor (Prufer 2005).

With the exception of Uxbenká and Ek Xux, Southern Belize remained only sparsely settled until after AD 500 when the region rapidly grew to include at least 10 monument bearing polities and over 100

smaller communities. The best known of these are Lubaantun, Pusilha, and Nimli Punit.

Artifacts and monuments indicate ties between southern Belize and the central Petén from AD 370-500, probably via trade routes through the southeastern Petén (Prufer 2005). During the subsequent period (AD 500-900) there may have been a shift in interaction and affiliation within the region, with epigraphic accounts of ties developing between southern Belize and sites located in the southeast periphery, especially Copan and Quirigua (Grube et al. 1999; Braswell et al. 2005; Marcus 1992; Wanyerka 2009: 440-477) and Altun Ha (Wanyerka 2009: 473), though archaeological correlates of these relationships are wanting. The southern Belize apogee was a time of significant expansion and population growth in the region, and those developments lie outside the scope of this paper. By the mid ninth century the area was in decline, and there is little evidence of any significant inland Postclassic occupation.

Conclusion

A precisely dated AMS radiocarbon chronology reveals an initial occupation of Uxbenká earlier than published accounts for most other sites in the region. It also suggests that Uxbenká may have been in decline prior to abandonment of other sites in region. This is the first chronology in the region based on absolute dating of core and settlement contexts across a range of architectural formations.

This could indicate a need to reassess other sites in southern Belize that have chronologies not built using absolute methods. While the idea of Uxbenká developing in an otherwise vacant geopolitical landscape is intriguing, it seems atypical. The southern Belize region is rich in resources; mineral and biotic (Dunham and Prufer 1998), has riverine access to coastal trade routes, and exceedingly fertile agricultural lands.

Such a reassessment should also include a refinement of our understanding of the decline of southern Belize polities and

their abandonment. Uxbenká does not have a significant construction phase after approximately AD 780, while other sites in the region are suggested to persist into the late 9th century. Terminal monument dates at Nimli Punit and Pusilha correspond roughly with the chronology for Uxbenká, possibly indicating that by the late 8th century, the entire region may have been in decline. While there is evidence that dispersed populations at Uxbenká and the region persisting through the 10th century AD, there is no evidence of community expansion, monumental building, or stela erections after AD 800.

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14 REDISCOVERING STINGRAY LAGOON

Heather McKillop

The discovery, mapping, and excavation of Stingray Lagoon, an underwater site in the middle of Punta Ycacos Lagoon, Paynes Creek National Park, southern Belize indicated Late Classic Maya salt production contemporary with nearby inland cities such as Lubaantun and Nim Li Punit. Publications focused on briquetage—the pottery vessels and supports from boiling brine in pots over fires to make salt. Subsequent survey elsewhere in the lagoon system led to the unexpected discovery of wooden posts, preserved because of the peat bog below the seafloor. Was there wooden architecture at Stingray Lagoon, and if so, how was it not found during survey, mapping, and excavation?

Introduction

Archaeological research in Punta Ycacos Lagoon was guided by the scientific method of hypothesis testing with expectations of finding underwater sites submerged by sea-level rise (Figure 1). Previous survey and excavation on the cays and coast of nearby Port Honduras underscored widespread occurrence of inundated Classic Maya sites on land and offshore at known sites (McKillop 2002, 2005a). Boat survey designed to identify underwater sites with no dry land component led to the discovery of Stingray Lagoon (McKillop 1995). Mapping, excavation, and study of the artifacts indicated the site was used for salt production, with overwhelming quantities of briquetage—pottery used to evaporate brine over fires to make salt (McKillop 2002). When subsequent survey unexpectedly revealed wooden architecture at other submerged sites (McKillop 2005b), I wondered whether wood was present at Stingray Lagoon, and had we missed it because we weren't looking for it?

Discovery and Excavations at Stingray Lagoon, 1991

Boat survey in 1991 was initiated to answer two questions: Was Wild Cane Cay, where I had carried out excavations since 1982, an isolated trading port on a sea-trade route, or was it integrated into a coastal network of Classic and Postclassic period settlements (Figure 1; McKillop 1996)? Were there underwater sites in shallow water as suggested by excavation of archaeological deposits below the water

table on Wild Cane Cay and from a systematic program of 172 offshore shovel tests around the island (McKillop 2005a)? In 1991 I initiated boat survey in the shallow coastal waters of Port Honduras and Punta Ycacos Lagoon, in southern Belize.

Port Honduras is a coastal bight with two lines of offshore cays paralleling the coast into which several rivers empty, including Deep River, Golden Stream, Middle River, and Seven Hills Creek, with the Rio Grande to the south. These waterways provide water access to Classic Maya inland communities, notably Nim Li Punit and Lubaantun. Punta Ycacos Lagoon is a large salt-water lagoon system north of the Deep River¹. Apart from families living on Wild Cane Cay and Village Farm, and itinerant fisher folk, the coastal area was uninhabited (McKillop 2005a).

The modern vegetation on the cays and coast dominated by mangroves was inhospitable for settlement due to the lack of dry land and salty soils (Wright et al. 1959): Red mangroves (*Rhizophora mangle*) line the coast and shores of the cays, with their prop roots extending into the water and rivers up to 12 miles inland. Many of the cays are completely underwater. Some cays include tidal flats inland from the red mangroves vegetated by salt-tolerant black mangrove (*Avicennia germinans*) and white mangrove (*Laguncularia racemosa*), as well as other trees and plants that grow on land but are tolerant to salty soils, notably buttonwood (*Conocarpus erecta*) and palmetto palms (*Acoelorraphe wrightii*; Wright et al. 1959). This mangrove succession also characterizes Punta Ycacos

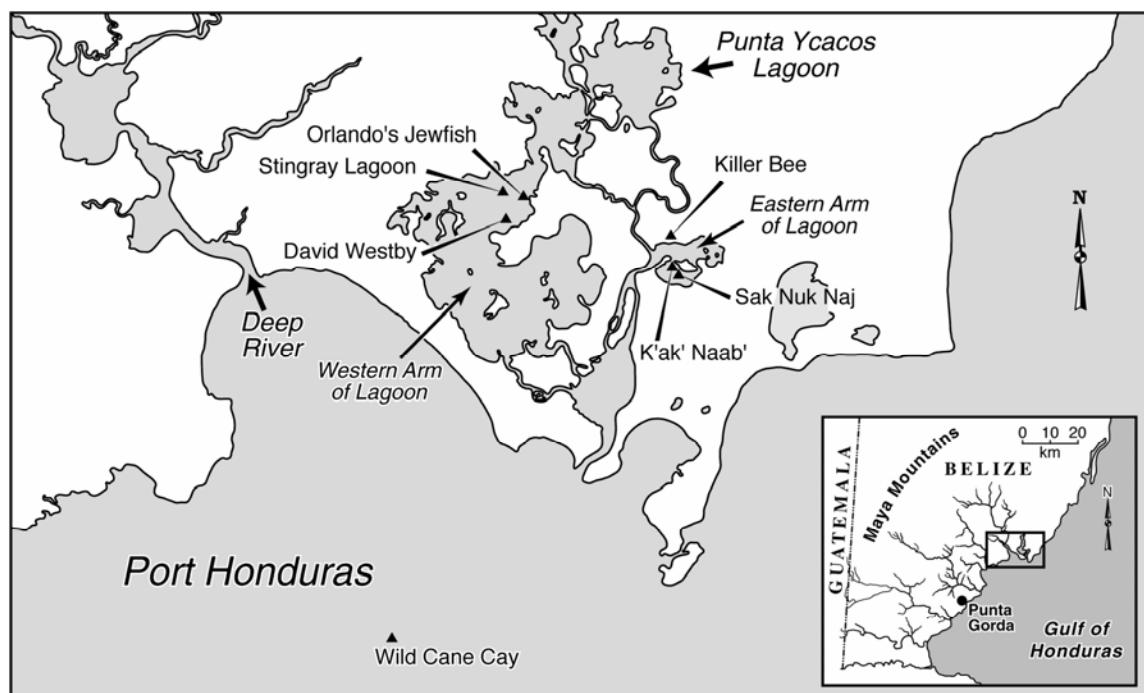


Figure 1. Map of Punta Ycacos Lagoon showing location of Stingray Lagoon and Other Sites, with Insert Showing Location in Southern Belize (Map by Mary Lee Eggart).

Lagoon, which is bounded on the north by pine savannah, grassland with scattered clumps of palmetto palms, pine *Pinus caribaea*, oak (*Quercus oleoides*), craboo (*Brysonima crassifolia*), and cutting grass (*Scleria bracteata*).

Regional boat survey was carried out in two ocean-going wooden dorys—large dugout canoes with planks raising the sides, operated with 20 HP engines. Both the Adel 2, at 32' in length, and the Seirrita, at 24' in length, were shallow-draft vessels, important for survey in shallow coastal waters. In the virtual absence of other boats, archaeological survey with two boats was insurance in case of boat trouble. For boat survey, the dorys traversed slowly back and forth across the lagoon, while we looked over the side of the boats for artifacts visible on the seafloor, about 1 meter below the water. Anyone seeing artifacts immediately jumped overboard to verify the find, with the knowledge that the boat driver would stop (McKillop 2002: Figure 2.5). Stingray Lagoon was discovered in the middle of the western arm of Punta Ycacos Lagoon, about

300 m from the closest shore (Figure 1). The surface of the site was about one meter below water. The site was completely submerged and did not extend on to land. Artifacts were embedded in the seafloor and continued to a depth of at least 20 cm, as discovered by subsequent excavations. Clearly, the site was “in situ” and not the result of shoreline erosion or redeposition, as at Canballam, Mexico (Dahlin et al. 1998).

A transit was set up at Stingray Lagoon for mapping the surface clusters of artifacts and for setting out excavations (McKillop 1995; 2002: Figure 2.6). Artifact clusters were flagged by a snorkeler, who also took underwater images (McKillop 2002: Figure 2.4). A fishing net was set out around the site to keep away stingrays that were attracted by the silt stirred up by our activities. A 2 x 2 m grid frame was made using red mangrove which sinks. The frame was held in place by stakes made from guava wood. Excavations proceeded using “dry land” techniques, basically ignoring the fact that we were standing in the sea.



Figure 2. Systematic Flotation Survey of Stingray Lagoon (Photo by H McKillop).



Figure 3. Fish Floats on Fishing Line Mark Posts at Stingray Lagoon (Photo by H McKillop).

Excavations were carried out in 4 subunits, using shovels and screening through $\frac{1}{4}$ " excavation box screens held in the sea (McKillop 2002: Figures 2.7-2.9). Artifacts and charcoal were placed in 100 lb plastic feed sacks. Material was exported under permit to LSU, sorted, analyzed, and returned to the Institute of Archaeology, Belize.

By ethnographic analogy to historic salt production (Reina and Monaghan 1981), Stingray Lagoon was identified as a salt work, characterized by an abundance of briquetage—the pottery vessels and supports used to evaporate brine over fires to make salt (McKillop 1995, 2002). By comparing the briquetage with household pottery from nearby Wild Cane Cay using the statistic “average median variation,” I found that the Stingray Lagoon briquetage was

standardized in dimensions indicating mass-production of the product, salt. The average median variation statistic calculates the variation from the median measurement, which in the case of the briquetage was the rim diameter and vessel support diameter. The salt jars (AMV = 10.5) from Stingray Lagoon were twice as standardized in vessel opening than household “Bedford Unslipped” pottery (AMV = 20.6) at Wild Cane Cay (McKillop 2002: Tables 4.2, 4.4).

Radiocarbon dating of wood charcoal from Stingray Lagoon indicated the site was used in the Late Classic period, contemporary with several known inland sites in southern Belize and adjacent Guatemala, where salt was in short supply. The radiocarbon date of A.D. 770 ± 50 (one sigma) provides a 95% likelihood that the sample age is somewhere between A.D. 670 and 870, in the Late to Terminal Classic period (McKillop 1995, 2002:52-53). The presence of Late to Terminal Classic ceramics includes Moho Red and Warrie Red types (McKillop 2002). Moho Red resembles Belize Red at Lubaantun (Hammond 1975) and at Belize Valley sites (Gifford 1976). Warrie Red is similar to Remate Red at Lubaantun (Hammond 1975) and Tinaja Red at Altar de Sacrificios and Seibal (Adams 1971; Sabloff 1975).

Elsewhere I have suggested that rituals took place to begin the salt-production season (McKillop 2002, 2010a), as at other salt works (Reina and Monaghan 1981). The material evidence of the rituals includes Moho Red serving vessel sherds, musical instruments (ocarinas), and localization of these ritual objects at certain sites. GIS of the surface mapped artifacts at Stingray Lagoon revealed the ritual objects were concentrated in Cluster A (McKillop 2002: Table 3.17, Figures 3.44-3.47). Overall at Stingray Lagoon, Moho Red (4.3%) and Warrie Red (14.3%) were present in small quantities, compared to the briquetage, which is Punta Ycacos Unslipped type (53.8%), and local water jars (27.1%; McKillop 2002: Figure 3.43).

Underwater Survey of Punta Ycacos Lagoon, 2004

Although the discovery, excavation, and study of material from Stingray Lagoon and three other sites demonstrated mass-production of salt likely for an inland market where salt was scarce (McKillop 2002), the four salt works could not have produced enough salt to meet the biological needs for salt of the nearby inland cities in southern Belize and adjacent Guatemala. In 2004 I began a systematic survey of Punta Ycacos Lagoon to address the extent of the salt production. I wanted to see whether there were more salt works, indicating a more extensive area of salt production that might have met the salt needs of inland consumers. Indeed, survey since 2004 has documented that salt production was extensive, with over 100 salt works in the Punta Ycacos Lagoon system (McKillop 2010a). The sites were marked by briquetage, as at Stingray Lagoon.

The 2004 survey technique consisted of pedestrian survey, with a team of three to four individuals walking side by side at arm's length, looking for artifacts on the seafloor. Walking disturbed the thick silt on the seafloor and reduced visibility. Still, underwater sites were located, some by artifacts visible on the seafloor, others by stepping on the artifacts. As is typical of swamps, there was wood in the lagoon and sometimes protruding from the seafloor. Since wood does not normally preserve in the tropical setting of ancient Maya sites, except under exceptional conditions, such as dry caves, cenotes, and dry temple rooms (Lentz and Hockaby 2009), I assumed the wood was a natural part of the swamp. Eventually, I decided we would excavate a piece of wood protruding vertically just above the seafloor. We freed the sediment from around the wood, by taking turns diving to the meter depth, holding onto the seafloor with one hand and digging with the other. After about a meter of digging, the wood was freed from the seafloor. Lifting the wood above the water, we saw the wood was clearly a post. The post was about one meter in length, straight, and with a pointed



Figure 4. Mapping Posts at Stingray Lagoon, with John Young holding Prism Pole and Bretton Somers on Walkie-Talkie to Total Station Person (photo by H McKillop).



Figure 5. Zoe Morris untangling Floats at Stingray Lagoon (photo by H McKillop).

end with large flake scars from cutting. That was site 15, which we renamed "Sak Nuk Naj." I wondered whether there were wooden posts at the other 14 sites found in 2004, or earlier, including the Stingray Lagoon site.

After locating a dozen more wooden posts at Sak Nuk Naj, which formed a rectilinear outline of what I termed a "salt shed" in my notes, we returned to site 14 to search for wooden posts. In addition to posts, we discovered a wooden canoe paddle, similar in design to the paddles used by the paddler gods on the incised bones from burial 116 at Temple 1 at Tikal (Trik 1963). We renamed Site 14, "K'ak' Naab," meaning "Fiery Water Place." In fact, we found wooden posts at all the other sites in the East Lagoon that year. The wooden posts protruding minimally from the seafloor and

were discovered more by feeling the seafloor with our hands than by seeing them from above the water.

Still, the age of the wooden posts and the canoe paddle needed to be determined, even though they were associated with Late to Terminal Classic pottery and briquetage. Radiocarbon dating demonstrated the wooden posts and the canoe paddle were contemporary with the briquetage and other artifacts at the salt works (McKillop 2005b). More than just an old canoe paddle, the radiocarbon date of A.D. 660-880 indicated that the site 14 canoe paddle was the first known ancient Maya canoe paddle (McKillop 2005b). Renamed K'ak' Naab', the artifacts and posts at the site were individually mapped using a total station from a cement datum placed on nearby land, revealing wooden structures with briquetage concentrated outside, perhaps from keeping the work area clean (McKillop 2007).

Mapping Posts Underwater, 2005-2009

A new survey project, "Mapping Ancient Maya Wooden Architecture on the Seafloor, Belize," was begun in 2005, with new survey techniques geared to finding wooden posts and preserving the integrity of the underwater sites (McKillop 2005b, 2007, 2010a). A team wearing masks and snorkels floated on "Research Flotation Devices" (RFDs), shoulder to shoulder, back and forth across sections of the lagoon in search of sites. Floating preserved the integrity of the seafloor, whereas sometimes walking created gaping holes. In addition, floating allowed greater visibility of the seafloor without stirring the loose silt that covered the seafloor. When a site was discovered, the systematic flotation survey was carried out at the site, flagging posts and temporally diagnostic or culturally significant artifacts. In shallow water we used surveyor's metal or plastic flags. In deeper water we used fishing line tied to fish floats, with the fishing line tied to a metal skewer and sunk into the seafloor by each find. Each flagged post and artifact was individually mapped using a total station. The digital data were transferred to the GIS Geomedia by

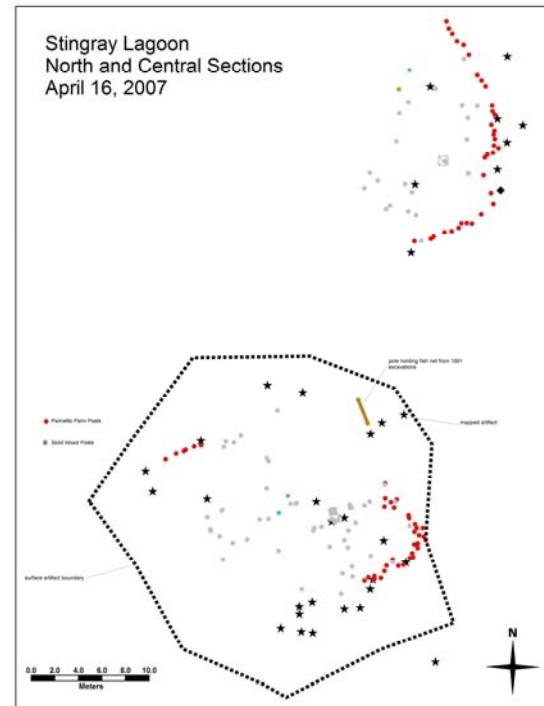


Figure 6. GIS Geomedia Map of Posts at Stingray Lagoon by Cory Sills.

Intergraph to create site maps (McKillop 2007, 2010a; Sills 2007; Somers 2007).

With the unexpected discovery of wooden posts demarcating buildings preserved in a peat bog below the seafloor in the eastern arm of Punta Ycacos lagoon (McKillop 2005b), I wondered whether we had missed finding wooden posts and artifacts in the western arm of the lagoon system, including at Stingray Lagoon and the other sites published in my *Salt* book (Figure 1; McKillop 2002). The lack of GPS coordinates, dramatic vegetation changes from 140 MPH winds from Hurricane Iris in 2001, and the fact that Stingray Lagoon was underwater and about 300 meters from the nearest shore, made relocating the site difficult. Despite several attempts to relocate Stingray Lagoon, it was not relocated again until systematic pedestrian survey in 2007, with a team of six archaeologists walking back and forth in the middle of the Western arm of Punta Ycacos Lagoon (Figure 1).

The three areas of Stingray Lagoon were relocated, along with abundant briquetage, poles with rope we used to string the



Figure 7. Post 18 Wood Sample held by Zoe Morris with Sampling Knife and Measuring Tape (photo by H McKillop).



Figure 8. Transverse Section of Stingray Lagoon Post 77 Sample Showing Preserved Wood Structure (photo by H McKillop).

protective fishing net during excavations, and guava stakes from our excavations. The red mangrove grid frame was later relocated at the Orlando's Jewfish site where we had excavated after Stingray Lagoon excavations in 1991. We began a systematic flotation survey to locate wooden posts (Figure 2). Ten-foot lengths of PVC pipe were used to mark survey lines, to assist keeping the survey team on course. The PVC pipes were moved as the survey team moved across the site. We used fishing line attached to fish floats (Figure 3). When our supply was depleted, we used plastic soda bottles and empty medicine bottles, with lids secured. Even though the lagoon is subject to micro-tidal variation of about 50 cm, the lengths of the fishing lines had to be adjusted during mapping to ensure artifacts were correctly

located. The fishing lines often became tangled in the deep and rough water, which made mapping difficult (Figures 4-5).

A total of 151 wooden posts were discovered and mapped (Figure 6). There were lines of palmetto palm posts in the central and northern areas of the site. Solid wood posts formed the outlines of wooden structures. The post diameters were measured using plastic sewing tapes, with the measurements recorded in waterproof notebooks (Figure 7). Wood samples were taken for species identification and for experimental research on tropical tree-ring dating (Figure 8; McKillop 2006). In order to get a clean section of wood without the worms that ate the wood protruding above the seafloor, we cleaned the peat away from each post and cut wood from below the seafloor. Post samples were immediately placed in labeled plastic bags full of water to prevent them from drying out which would distort the wood structure and make species identification difficult. We placed the wood samples in fresh water to begin the conservation process of desalinization. The wood samples were periodically rinsed in fresh water, exported under permit to LSU, and where conservation continued.

Species identification of the waterlogged wood from Stingray Lagoon and other Paynes Creek underwater sites followed a different methodology than is typical for Maya sites where the wood is charred and dry. Normally wood charcoal from Maya sites is identified using a reference collection of charred wood. Even for wooden lintels at Tikal, the wood samples were charred in preparation for species identification (Lentz and Hockaby 2009). Instead of attempting to burn wet wood, I contacted wood anatomist Mike Wiemann and brought him to LSU under a grant, where he began species identification, using modern wood samples and thin-sections from the USDA Forest Products Lab in Madison, WI (McKillop 2006). Wood species identifications of posts are currently underway, with additional funding (McKillop 2010b). Beginning in 2010, we are sampling smaller pieces of posts and



Figure 9. Front View of Figurine Whistle from Stingray Lagoon North (photo by H McKillop).



Figure 10. Profile View of Figurine Whistle from Stingray Lagoon North (photo by H McKillop).



Figure 11. Front View of Stingray Lagoon Trickle Ware Bowl with Preserved Paint (photo by H McKillop).



Figure 12. Side View of Stingray Lagoon Trickle Ware Bowl with Preserved Paint (photo by H McKillop).

identifying the wood species at our field station (McKillop et al. 2010).

In addition to well-preserved wood, ceramics retained their surface finish and slip, albeit often discolored black. Thick silt, up to 15 cm in depth, covered the seafloor and made searching for posts in the underlying peat difficult. However, the deep silt preserved the surface finish and paint on ceramics, which was eroded at most of the other Paynes Creek underwater sites (Figures 9-12).

Discussion and Conclusions

How can I explain the fact that we did not find wooden posts during survey,

mapping, and excavations at Stingray Lagoon in 1991 when they were indeed part of the site? Using the scientific method in archaeological research includes both inductive and deductive reasoning based on observations of objective reality. My initial deductive reasoning for survey in Punta Ycacos Lagoon was based on hypotheses with implications of what would be found to support or negate a hypothesis. I expected to find underwater sites, since we had found inundated deposits on land at Wild Cane Cay and deeply buried, *in situ* deposits by offshore shovel testing around the island (McKillop 2002, 2005)².

Based on knowledge of the lack of preservation of wooden architecture in the tropical landscape of ancient Maya sites, searching for wooden posts was not part of my research design for identifying salt works during the 2004 underwater survey in Punta Ycacos Lagoon. In fact, field survey was focused on locating new sites to identify the extent of salt production and collecting 30 measurable Punta Ycacos pottery rims and 30 measurable Punta Ycacos vessel supports to study variability in the standardization of salt production. During the 2004 systematic survey we did not find posts until site 15 of that year and only then because we repeatedly encountered what I initially considered wood that was part of the natural landscape. Even when we did find posts, most were difficult to find. Most posts barely protruded from the mangrove peat of the sea floor. Deep silt covered the seafloor and obscured visibility in most areas, although Hurricane Iris scoured parts of the lagoon floor in 2001, leaving artifacts and posts visible without a covering of silt. This was not the situation at Stingray Lagoon or in the East Lagoon where we found sites in 2004. After we knew posts were present, each new site survey built on the knowledge that posts were present at other sites and the knowledge that they formed rectangular patterns, with lines of palmetto palm posts located at a distance from solid wood posts. What more lies buried below the seafloor in Punta Ycacos Lagoon?

Acknowledgements Field research at Stingray Lagoon in 2007 was carried out under permit from the Belize government Institute of Archaeology. I appreciate the friendship and hospitality of our host family, Tanya Russ and John Spang, as well as the field team, Bretton Somers, Mark Robinson, Cory Sills, Zoe Morris, and John Young. This material is based upon work supported by the National Science Foundation under Grant No. 0513398. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the

author and do not necessarily reflect the views of the National Science Foundation.

¹Punta Ycacos Lagoon and area was declared Paynes Creek National Park in 1994. The Port Honduras coastal and offshore area was declared Port Honduras Marine Reserve. Both protected areas are co-managed by TIDE (Toledo Institute for Development and the Environment), although archaeology remains under the mandate of the Belize government Institute of Archaeology.

²However, the inundated deposits had been an unexpected part of stratigraphic excavations in search of obsidian for identifying the timing and extent of long-distance trade at Wild Cane Cay (McKillop 2005).

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15 INVESTIGATIONS OF THE AGRICULTURAL TERRACING SURROUNDING THE ANCIENT MAYA CENTRE OF MINANHA, BELIZE

Scott A. Macrae and Gyles Iannone

Since the 1970's it has generally been understood that intensive agricultural practices were essential to the development of ancient Maya state formation in the Vaca Plateau. Terraced field systems were the method of choice with respect to the enhancement of agricultural production. Yet, we still have a limited understanding of the development and expansion of terrace systems found throughout the Plateau. Over the past nine years a number of researchers have attempted to build a more detailed understanding of the terrace field system at the ancient Maya center of Minanha. The results of the ongoing study will be detailed in this paper, with particular emphasis on the factors involved in the initial development of the field systems and what drove its eventual expansion.

Introduction

Our understanding of ancient Maya agricultural practices has shifted dramatically over the past 40 years. Whereas scholars once envisioned a landscape of virtually vacant ceremonial centers surrounded by small populations of humble farmers practicing slash-and-burn agriculture, contemporary researchers now see a myriad of kingdoms, large, hierarchically arranged populations, and a diverse group of agriculturists employing a plethora of extensive and intensive agricultural methods.

Archaeology in the Contreras Valley

Even though most archaeologists are now quite comfortable with the idea that a great deal of ancient Maya crop production was carried out using intensive agricultural systems – such as terracing – we continue to have a limited understanding of how these systems were organized, and how they developed over time. Over the past twelve field seasons members of the Social Archaeological Research Program have brought various research methods to bear on these subjects, as part of our broader examination of the development, florescence, and eventual decline of the ancient Maya community of Minanha, which is located in the North Vaca Plateau of west central Belize (Connell 2001; Iannone et al. 2006; Macrae 2010; McCormick 2007:75; McCormick 2008;

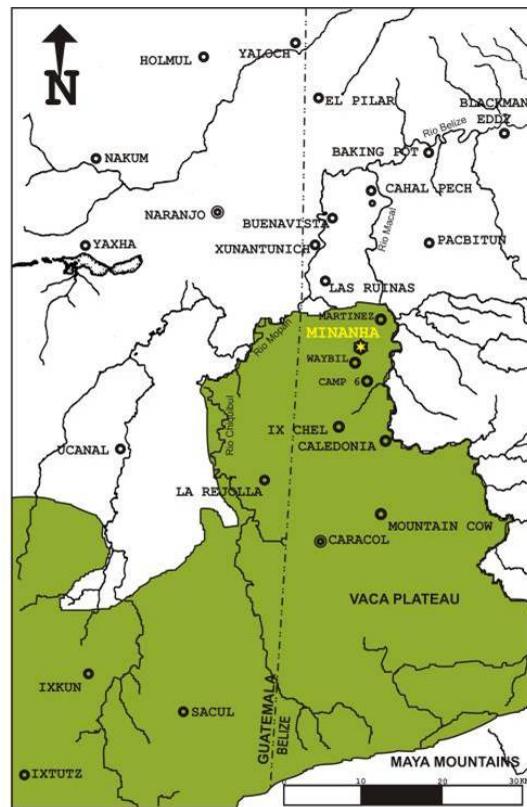


Figure 1. Regional Map Showing the Location of Minanha.

Pollock 2003; 2004; 2006a; 2006b) (Figure 1).

The primary focus of our agricultural research is a 1 km square study zone centered on the extensively terraced, and densely settled, Contreras Valley, located approximately 1.5 km southeast of the Minanha epicentral court complex (Figure 2). Our first efforts to understand

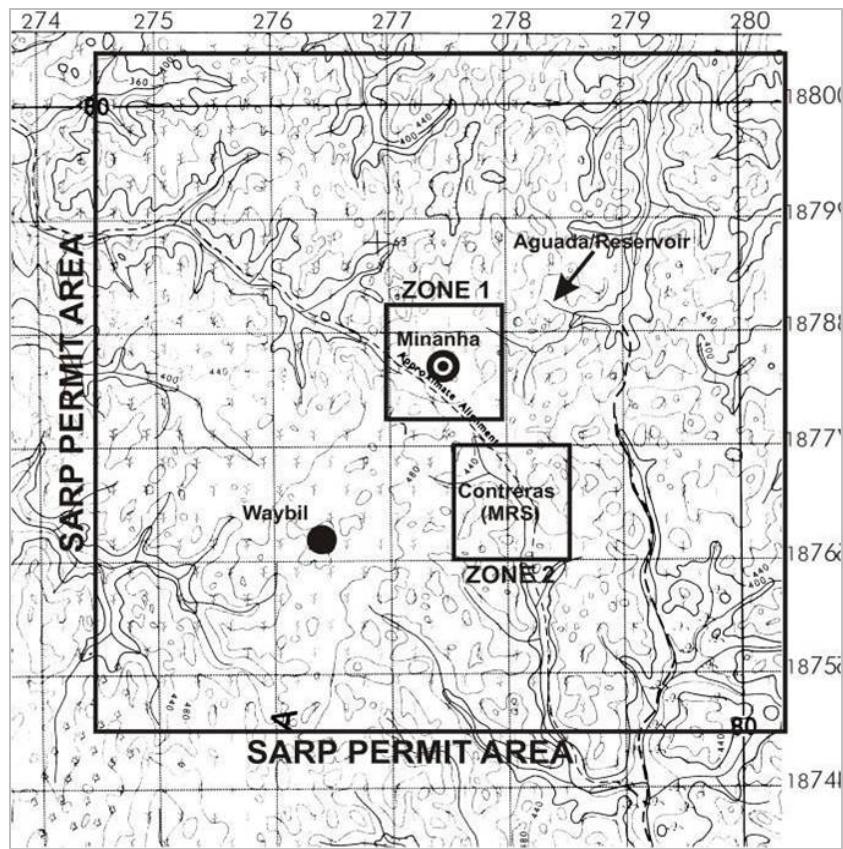


Figure 2. Location of Phase II Settlement Study.

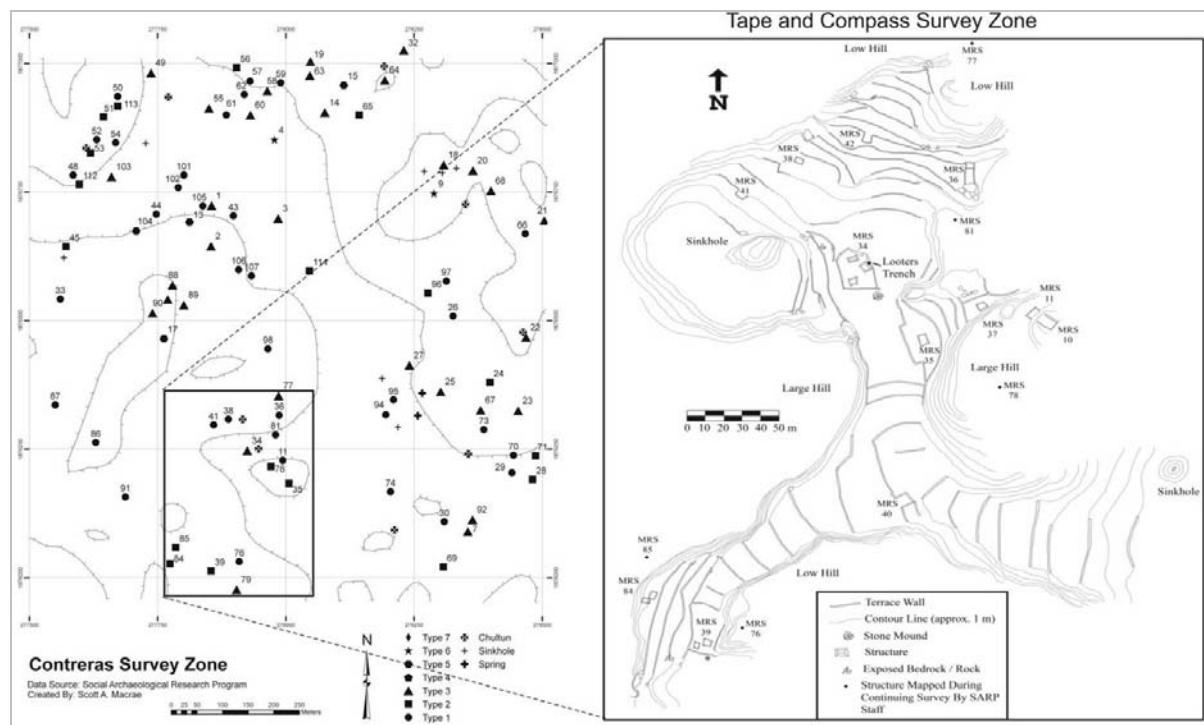


Figure 3. 2003-2004 Terrace and Settlement Study.

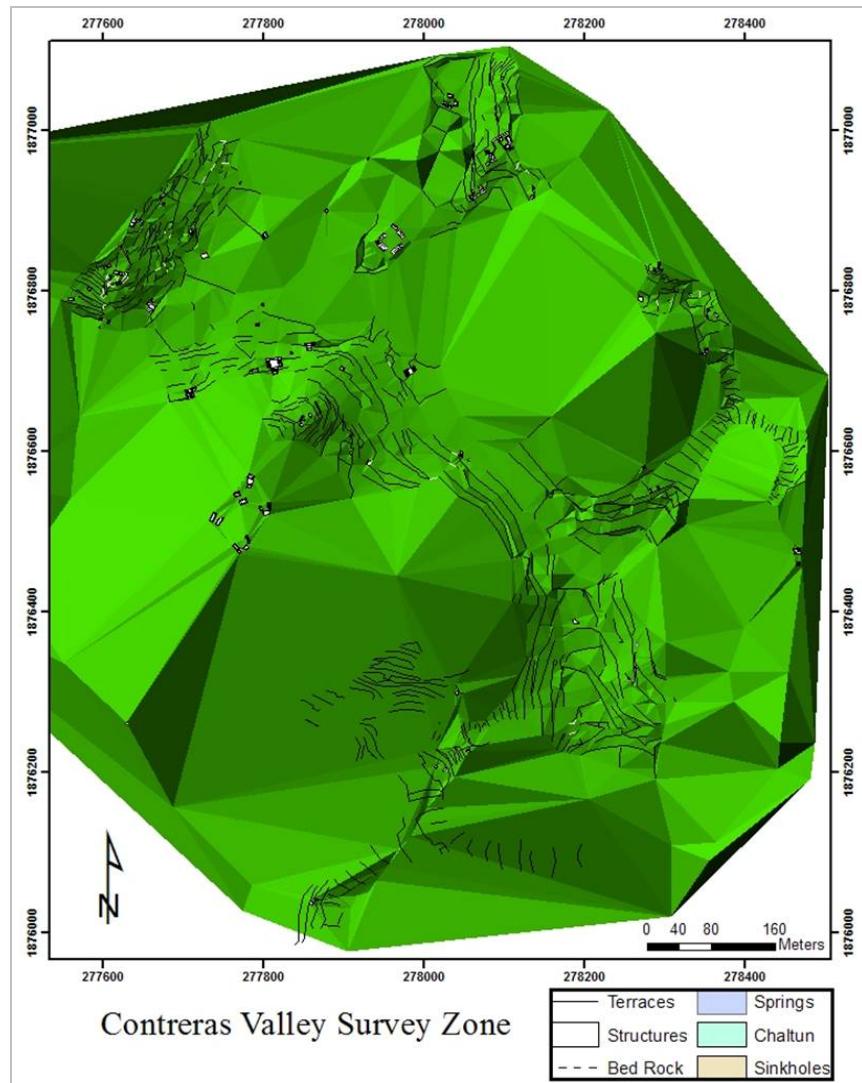


Figure 4. 2007-2010 Terrace and Settlement Survey.

Minanha's terrace systems were initiated by Sam Connell and Ted Neff in 2000 (Connell and Neff 1999; Connell 2000, 2001:113; Killpack 1997:69; 1998). This involved a preliminary examination of the location and classification of terrace types, and an assessment of their relationships to the natural topography. During the 2002 field season Elizabeth Webb, Ryan Primrose, and Henry Schwartcz collected soil samples from a number of terraces and subjected these to isotope analysis, which suggested a weak signature for the growth of maize (Macrae, Pollock, Webb, and Schwarcz 2008; Webb, Primrose, and Schwarcz 2002). Subsequently, in 2003 and 2004, Adam

Pollock conducted an intensive survey and excavation of a 5 ha portion of the terrace system in the southwest corner of the study zone (Pollock 2003; 2004; 2006a; 2006b) (Figure 3). This research provided us with the first information on construction techniques and dating for the Contreras terraces. Pollock's study was complemented by a systematic GPS survey of the study zone carried out by Jesse Phillips (Iannone et al. 2006). This survey substantially increased the number of settlement units originally mapped by Connell and Neff. Finally, between 2007 and 2010 Scott Macrae conducted intensive survey and detailed assessment of the terraced field

system across the entire 1 km study zone (Figure 4). Although the study is still in progress, we have already mapped 67 settlement units comprised of 133 structures, and 730 terrace sections (Macrae 2010; Macrae and Stringer 2007; Macrae and Longstaffe 2008; Macrae and Iannone 2009). In the remainder of this paper we will present the preliminary results of these various research endeavors, with particular emphasis on how the terrace system developed in conjunction with the associated settlement that is currently being examined by Gyles Iannone and Carmen McCane (Iannone et al. 2006; Macrae 2010; McCormick 2007:75; McCormick 2008).

Contreras Valley Agricultural Terraces

In the most basic sense, terraces are retaining walls built of stacked stones running perpendicular to the slope of a hill slope. These features serve to retain, and thus increase the depth of soil, regulate and distribute water, and enhance the nutrient content of the soil (Beach et al. 2002:379; Kunen 2001:326; Treacy and Denevan 1994:93-95). Terraces can be classified into several different types based on how they exploit topographical situations, and in terms of their construction methods. The different construction methods have been used to group terraces into “sets”, which are “individual terraces (that) are roughly parallel and collectively appear to manage the same immediate topographic setting” (Ashmore et al. 1994:259). At Xunantunich, Neff (2008:63-66) created a classification scheme based on terrace characteristics and associations with other terraces and structures. This classificatory model was followed at Minanha, although it was slightly tailored for the Contreras Valley.

Contour terraces are the most common. These are known to vary in length, and follow the topography of the hill slopes (Beach et al. 2002:386) (Figure 5). Within the Contreras Valley they are found prolifically along the twisting slopes of the interfluvial residual hills and the primary valley. Linear terraces are placed independent of contours, and have been

observed to run up and down slopes between terrace systems to create lattice-like patterns, or perpendicular to contour terraces to create vast level fields (Demarest 2004:138; Kunen 2001:326; Treacy and Denevan 1994:98-100) (Figure 6). Box terraces are found on moderately flat land, in close association with residential complexes (Beach et al. 2002:386; Dunning and Beach 1994:58; Kunen 2001:326) (Figure 7). This set also includes many terraces that are not strictly box terraces, but rather terraces exhibiting extreme complexity, in close association with settlement units. Cross-channel terraces, also known as weir or check dams, are usually short in length and tall in height, and are found in the smaller subsidiary valleys between the residual hills, running perpendicular to gullies, drainages, and other locations that exhibit constricting topography (Beach et al. 2002:379; Dunning and Beach 1994:59; Kunen 2001:326; Treacy and Denevan 1994:96) (Figure 8). Finally, footslope terraces are found at the base of steep slopes that exhibit few, if any, terraces (Figure 9). These terraces are designed to control erosion and collect runoff, thereby creating large, flat, plots of land below the hill slopes (Beach et al. 2002:387; Dunning and Beach 1994:59-60; Kunen 2001:327; Treacy and Denevan 1994:100-101). They are rare within Contreras Valley, as hills rarely get steep enough to be suitable for footslope terracing. The aforementioned five terrace types, with their specific topographic locations, provide an empirical way to group them. The issue that arises, however, is whether these sets reflect differential social organization, or simply the environmental situation.

Discussion

The terraces in the Contreras Valley can, in one sense, be seen as a single system. The terraces are extensive, covering all land conducive to their construction. They also complement each other, and work with the natural contours of the valley, to retain soils and distribute rain water. The terrace system also incorporates several springs. Although there appears to be little clear

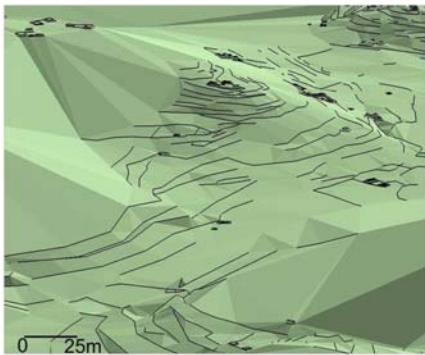


Figure 5. Contour Terraces in Contreras, Minanha.

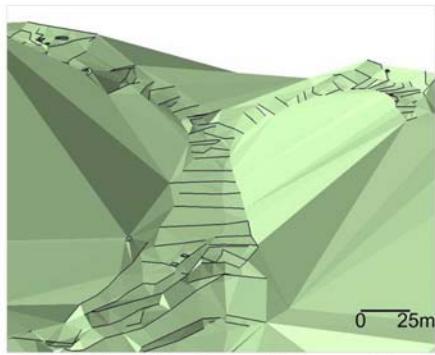


Figure 8. Cross-Channel Terraces in Contreras, Minanha.

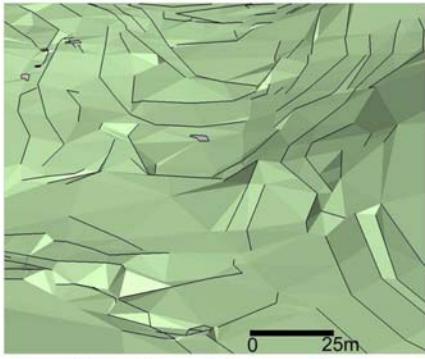


Figure 6. Linear Terraces in Contreras, Minanha.

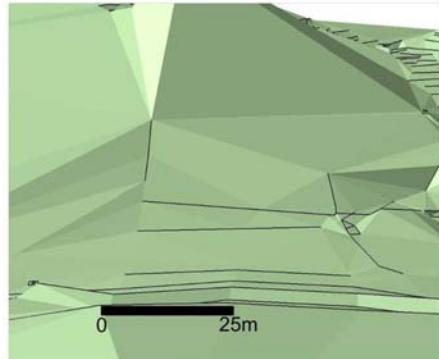


Figure 9. Foothslope Terraces in Contreras, Minanha.

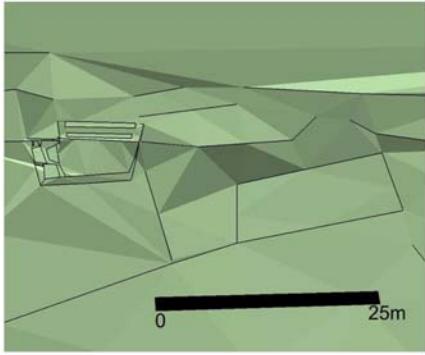


Figure 7. Box Terraces in Contreras, Minanha.

demarcation suggestive of individual ownership, there are a few areas in close proximity to settlement units that exhibit a significant increase in the frequency and complexity of terraces, which does imply construction, and hence ownership, by particular households (Macrae 2010:128-130) (Figure 10). Overall, the terrace system transcends both terrace types and

slope characteristics, and incorporates large terrace networks that extend beyond individual households and terrace “sets”, as well as pockets of highly complex terrace sub-systems that are likely reflective of more intensive, small-scale household production.

Labor investments have also been used to investigate the organizational aspects of the

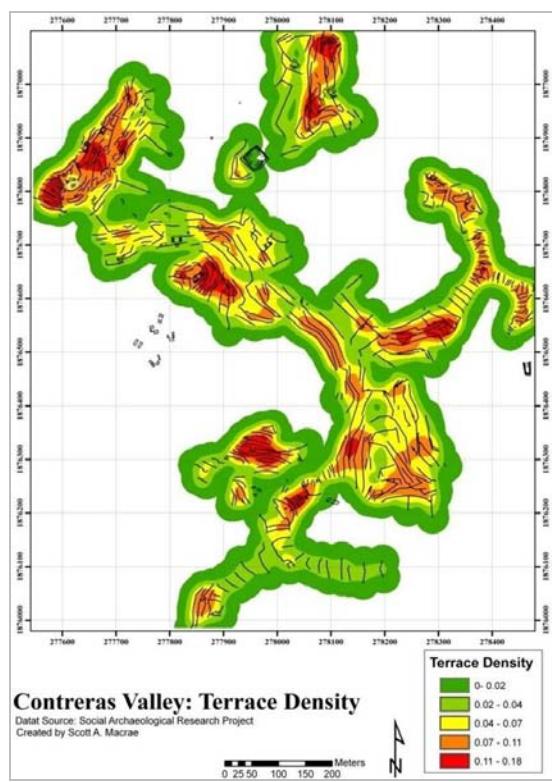


Figure 10. Terrace Density in Contreras, Minanha.

construction and maintenance of the terrace system. Excavations by Pollock (2006a:222-223) revealed that the natural step-like nature of the limestone bedrock was incorporated into the construction of many of the terrace walls. The natural bedrock outcrops were also taken advantage of, by either starting or ending on them, and in some cases incorporating them in the overall design. These two practices significantly reduced the level of labor necessary for the construction and maintenance of the terrace system, and they suggest that a level of practicality, and degree of flexibility, are inherent in the apparent uniformity of terrace construction and organization.

The ongoing Contreras Valley survey has confirmed Pollock's initial findings when it comes to labor investment. This study has revealed that there is little uniformity in the quality of construction, suggesting varying levels of labor investment (Macrae et al. 2008; Macrae 2010). This observation emanates from insights into the distribution of higher quality terraces, based on stone

size and terrace height. Such terraces tend to be found in close proximity to structures, and/or occupy several key agricultural locations that exhibit better access to water and soils; in other words, areas that are more conducive to terracing. Low quality terraces often articulate high quality terraces, creating convex platforms, or take the form of short contour terraces. These observations should, however, be treated as preliminary until significant excavation is undertaken.

To date, our various analyses of the terrace system and associated settlement have generated a range of data that have been used to assess the socio-political and socio-economic organization that was involved in the initial construction, and eventual expansion, of the Contreras Valley terrace system. The uniformities found within the terrace construction, organization, and type, are suggestive of a well founded knowledge of the principles of terrace construction. The integration of the various terrace sub-systems, and the protracted length of several of the terraces, suggests a level of interaction that extends beyond the household (Dayton 2008:127,167). The dispersed and uninterrupted water flow in the valley would have also required a large level of interconnectivity to effectively manage distribution across the field system. These characteristics point towards a degree of centralized organization.

In contrast, evidence for higher terrace densities within close proximity to certain settlement units suggests a piecemeal process of construction. The construction of the high density pockets would have also required higher levels of investment, but this was apparently localized in nature (Macrae 2010:131). The flexibility found in the labor saving methods, such as incorporating natural features into terrace construction, also suggests an intrinsic knowledge of the local topography, in addition to a detailed understanding of fluvial and sediment deposition processes. These lines of evidence point towards a degree of

MINANHA PHASE II SETTLEMENT STUDY: CONTRERAS ZONE		Identified Settlement Units Within the Contreras Zone	Total # in 15% Sample	Randomly Selected Settlement Units
Type	Total # in Zone			
I: isolated mound (less than 2 m high)	45	MRS10, MRS11, MRS26, MRS29, MRS30, MRS33, MRS36, MRS37, MRS38, MRS40, MRS41, MRS42, MRS43, MRS44, MRS48, MRS50, MRS52, MRS54, MRS57, MRS59, MRS61, MRS62, MRS66, MRS70, MRS73, MRS74, MRS76, MRS86, MRS87, MRS91, MRS94, MRS95, MRS97, MRS98, MRS101, MRS102, MRS105, MRS106, MRS107, MRS108, MRS109, MRS110, MRS111, MRS115, MRS116	6.8	MRS11, MRS36, MRS43, MRS57, MRS61, MRS86
II: 2-4 mounds (informally arranged; all less than 2 m high)	18	MRS24, MRS28, MRS35, MRS39, MRS46, MRS51, MRS53, MRS56, MRS65, MRS69, MRS71, MRS78, MRS84, MRS85, MRS96, MRS112, MRS113, MRS114	2.7	MRS78, MRS85, MRS96
III: 2-4 mounds (orthogonally arranged; all less than 2 m high)	29	MRS1, MRS2, MRS3, MRS7, MRS14, MRS16, MRS18, MRS19, MRS20, MRS22, MRS23, MRS25, MRS27, MRS34, MRS49, MRS55, MRS58, MRS60, MRS63, MRS64, MRS67, MRS68, MRS77, MRS81, MRS88, MRS89, MRS90, MRS92, MRS103	4.3	MRS2, MRS22, MRS63, MRS89
IV: 5 or more mounds (informally arranged; all less than 2 m high)	0	none	0	none
V: 5 or more mounds (at least 2 arranged orthogonally; all less than 2 m high)	4	MRS13, MRS15, MRS17, MRS104	0.6	MRS15
VI: 1 or more mounds (at least 1 being 2-5 m high)	2	MRS9, MRS4	0.3	MRS4
VII: 1 or more mounds (at least 1 being higher than 5 m)	0	none	0	none
TOTALS	98		14.7	15

Table 1. Minanha Phase II Settlement Study: Contreras Zone.

decentralization with respect to the construction and maintenance of the terrace system.

In summary, the results of our study currently support the idea that the Contreras Valley terrace system exhibits qualities of both centralized and decentralized organization. This amalgamation of characteristics is the reason why it is important to consider the heterarchical approach. Heterarchical organization exists in the middle ground, incorporating aspects of both hierarchical and non-hierarchical social organization (Crumley 1995:3; Scarborough et al. 2003:xiv). Social structures defined as heterarchical are more reflective of the complex organization, adaptability, and flexibility of typical human societies (Crumley 1995:3; Scarborough et al. 2003:xiv).

Development of the Contreras Valley

To help understand the socio-political and socio-economic organization behind the relic terraces of the Contreras Valley, it is useful to examine the developmental sequence of the terrace system in conjunction with that of the greater Minanha Community. Excavations over the past twelve years have provided dates for both structures as well as several terraces found underlying structures, and detailed insights into the development, and eventual decline, of the broader Contreras community. The following synthesis is heavily indebted to the settlement research carried out as part of Gyles Iannone's overarching study of the greater Minanha community (Iannone 2008), and Carmen McCane's Ph.D. research on the settlement of the Contreras Valley (2007:74-98; 2008). The latter study involved the investigation of a 15% stratified sample of the 98 settlement units known to exist at the inception of the

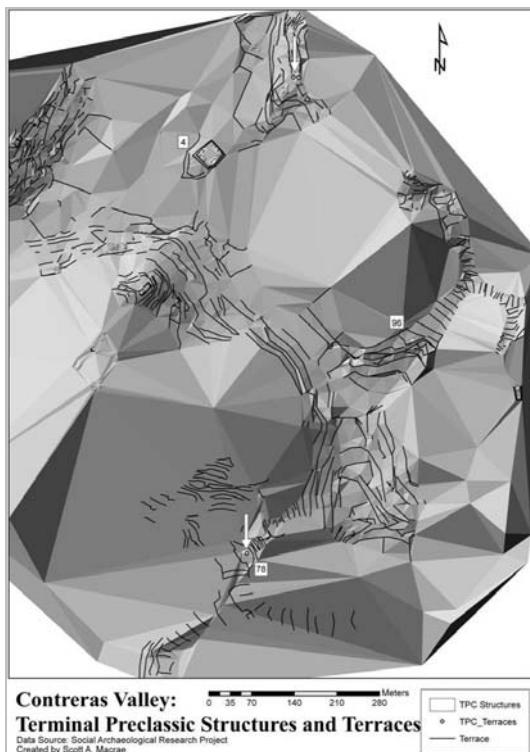


Figure 11. Contreras Valley: Terminal Preclassic Terraces and Structures.

study, resulting in the excavation of large portions of all of the structures in a total of 15 settlement units (Table 1). The stratified sample was based on the Xunantunich Archaeological Project's settlement typology, which classifies settlement units into seven types based on the number of structures present, their degree of formal arrangement, and the height of the tallest structure (Ashmore et al. 1994; Neff et al. 1995; 2008:63-66).

Our examination of the terrace system and the settlement pattern has demonstrated a change in agricultural strategy over the years of occupation of this small valley. Beginning with the Late Terminal Preclassic, we see the initial exploitation of the Contreras Valley (Figure 11). In total, 13% of the excavated settlement units were occupied at this time. These first settlement units followed the "Principal of First Occupancy"; they settled near prime agricultural lands, and perennial springs, and likely lived in small, kin-based units. Patricia McAnany (1995) has underscored the connections between land tenure and

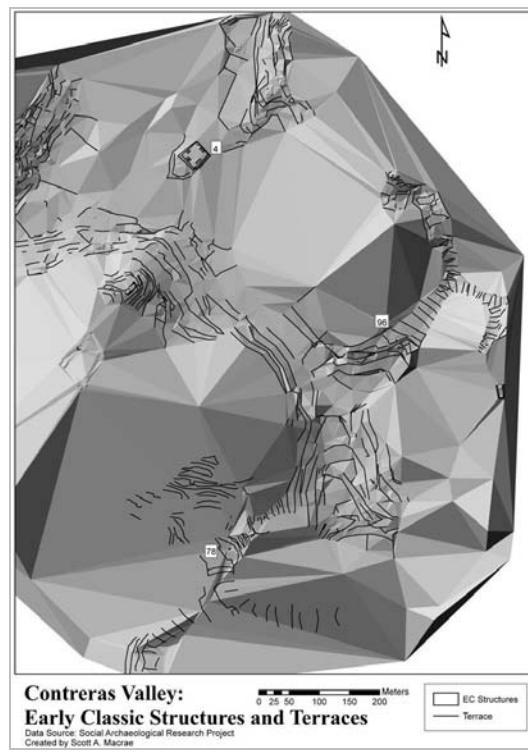
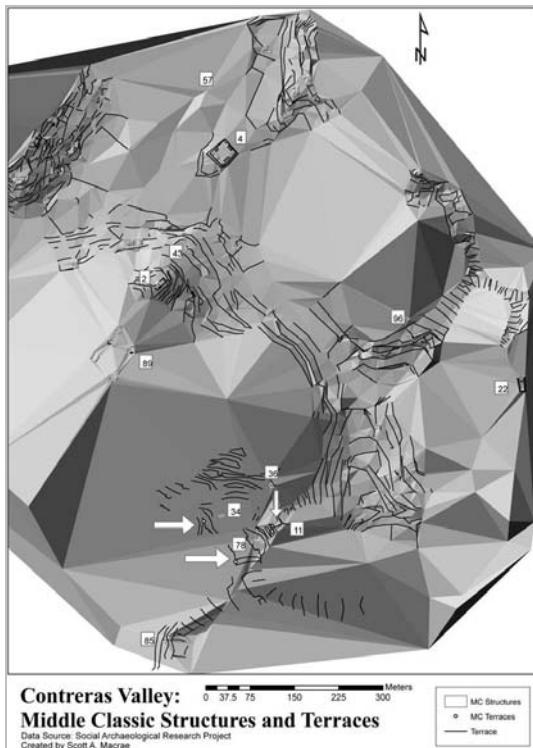


Figure 12. Contreras Valley: Early Classic Terraces and Structures.

lineage-based resource holding groups. She argues that founding lineages had the ability to lay claim to resource rich lands, and they maintained this claim through their ancestral rights (McAnany 1995:97). This correlates with the position of the large MRS4 courtyard, which is located in a prominent position in the valley bottom, near a perennial spring, where agricultural lands were accessible and easily worked using a slash-and-burn technique, requiring little to no cultural modification to the landscape (Macrae 2010:136). The eventual construction of terraces by these early households would have been an attempt to conserve and improve their local agricultural lands. The exploitation of prime agricultural lands by these original inhabitants was supported by the development of isolated pockets of denser, more complex, higher quality terraces within the interfluvial valleys near their house lots. These terrace sub-systems were produced in a piecemeal fashion, and employed labor saving methods, such as the use of the natural bedrock features both above and below



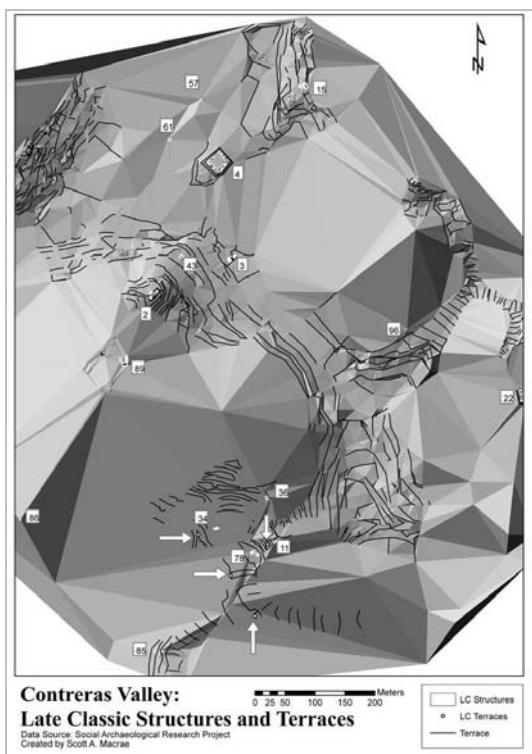


Figure 14. Contreras Valley: Late Classic Terraces and Structures.

ownership of land, and their increasing prevalence may therefore also imply increasing competition, and stress on agricultural resources.

Terraces were produced in a very uniform manner in the Middle Classic, and they developed into clear sets based on topographical situations and association with settlement units. The interconnectivity with surrounding terrace sub-systems, high number, and protracted length of several of these terraces suggest a level of interaction that extends beyond the household, and involves a large-scale construction process. This suggests a degree of centralized organization.

However, when the construction of the whole terrace system is examined there are several qualities that suggest that the construction of the larger centralized terrace sub-system was carried out in a more decentralized manner by the local inhabitants of the Contreras Valley. These include: 1) the flexibility in terrace construction expressed in the labor saving methods, and the intrinsic knowledge of the

landscape, that can be identified throughout the system; 2) the interconnectivity between the larger terrace sub-system and the earlier, smaller pockets of dense, high quality terraces; 3) the development of clear, well defined terrace sets that implies previous knowledge of terrace construction; and, 4) the lineage-based settlement distribution. This data suggests that, although there is evidence to support the traditional idea that the socio-political and socio-economic organization of terraces systems was centralized, there are other lines of evidence that suggest a local, decentralized organizational strategy.

During the Late Classic period a small royal court established itself at Minanha. Not surprisingly – given the “gravitational pull” of such a “full-service center” – the Contreras Valley experienced its highest occupation at this time, with 93% of excavated settlement units in use (Figure 14). The prolific spread of settlement units appears to correlate with the majority of the visible terraces found throughout the Contreras Valley. Support for this statement can be found in four terrace excavations. The drive to maximize production likely reflects, at least partially, the development of the Minanha royal court, and the resulting increase in the taxes that were required to support it, as well as to generate the tribute that was probably paid by the new Minanha elite to larger, hegemonic city-states, such as Caracol. During this period the large MRS4 courtyard expands to its greatest size. One of the effects of the “Principle of First Occupancy” is that, because founding settlements lay claim to the prime resources, they can, over time, develop an elevated level of wealth above later occupants (McAnany 1995:98-99). This is apparent in the development and overall size of MRS4 when compared to the other settlement units in the valley. The founding role and hierarchical position of groups such as MRS4 would have made them targets of the integrative strategies of the ruling elites (Iannone et al. 2008:155; Yaeger and Robin 2004: 164). This would have resulted in closer, although likely constantly negotiated,

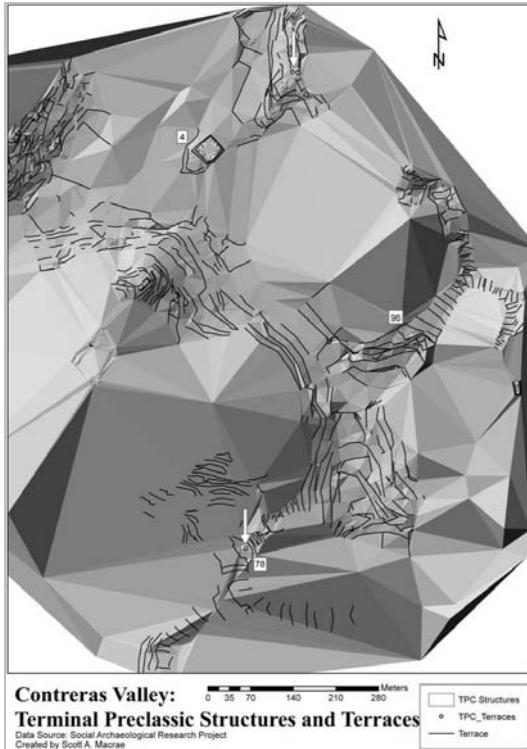


Figure 15. Contreras Valley: Terminal Classic Terraces and Structures.

relationships with the elite at the Minanha epicenter, further elevating the status of the MRS4 lineage among the inhabitants of the Contreras Valley. Overall, the changes in the location and frequency of settlement types suggest a hierarchical settlement organization within the Contreras Valley.

The Terminal Classic period saw the collapse of the royal court in the Minanha epicenter, at which time the Contreras Valley witnessed a slow depopulation, with only 40% of excavated settlement units being occupied (Figure 15). Some of the founding lineages inhabiting the larger settlement units still flourished, particularly those located near improved terrace lands and perennial springs. These resources would have been crucial during periods of extended droughts. Such groups include the long-standing MRS4 courtyard. At this time we also see the construction of MRS63, located on the floor of one of the interfluvial valleys, near MRS4, and the continued occupation, and expansion, of the adjacent MRS15 (Macrae 2010:140). The only occupied Type III settlement unit, MRS89,

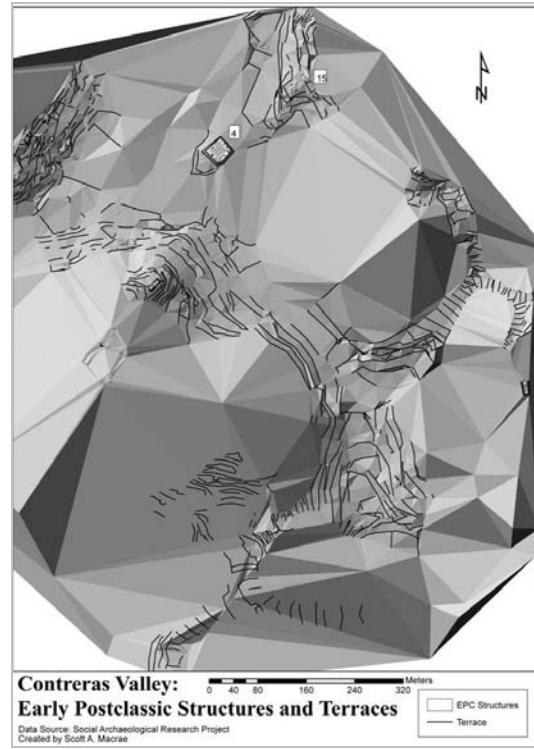


Figure 16. Contreras Valley: Early Postclassic Terraces and Structures.

is located on a hilltop. There are also two remaining Type I trojas, MRS43 and 86. This data suggests, to some extent, that there was a continuation of the previously held socio-political and socio-economic organization of the Middle and Late Classic periods (Macrae 2010:140). Nevertheless, the spatial location of the surviving settlement units, overall reduction in the number of Type I trojas, significant decline in hilltop settlements, as well as many smaller Type II and III settlement units – which may indicate that the landless groups of the Contreras Valley were either pushed out, or left when the influence and wealth of the royal court at Minanha collapsed – and the continued prosperity of the MRS4 lineage, supports the continued importance of the “Principal of First Occupancy”, as well as reduced pressure on the agricultural landscape. This suggests the likely return to a decentralized organization.

During the Early Postclassic the number of occupied loci appears to be consistent with that of the Terminal Preclassic period, with only 13% of excavated settlement units

being occupied (Figure 16). During this period all the structures within MRS4 are in use, attesting to the longevity of this primary settlement loci (Macrae 2010:141). The only other settlement unit in use during this period, the adjacent MRS15, is reduced to one structure. Once again, two of the principal reasons for the continued occupation of MRS4 were likely its location within improved terrace lands, and proximity to a perennial spring, both of which would have been crucial given the various droughts that we believe to have taken hold at this time. It may also relate to the degree of power and wealth that this lineage accumulated over its long occupation of the Contreras Valley. In the end, what is clearly visible in the occupation during the Early Postclassic period is a return to a decentralized, lineage based households settlement pattern, with a smaller population, similar to that exhibited by the Terminal Preclassic and Early Classic periods. Old terraces continued to be used, but few new ones were built.

Conclusion

In conclusion, we continue to attempt to build-up a multi-faceted understanding of the development, expansion, and eventual decline of intensive agriculture in the vicinity of the ancient Maya city-state of Minanha. This paper has presented some of our preliminary insights. Hopefully, over the ensuing years, we will be able to generate a more fine-grained understanding of; how early did terrace agriculture begin in the sub-region? Why were such agricultural practices initiated? What types of crops were grown? How terrace construction and planting were organized, and how did this change over time? How did production per capita change over time, and why? Did declining production play a role in the demise of the Minanha royal court, and the eventual decline of the support population? And how can we use our understanding of past agricultural practices to assist contemporary farmers in the region, who currently favor low-energy, largely extensive, highly destructive, limited

production slash-and-burn agriculture, rather than the initially more labor intensive, but much more sustainable, terrace agricultural practices of the ancient Maya.

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16 THE ROLE OF CAVES AT PACBITUN: PERIPHERAL TO THE SITE CENTER OR CENTRAL TO THE PERIPHERY?

Jennifer U. Weber and Terry G. Powis

For the past two seasons the Pacbitun Preclassic Project has been investigating cave sites in the foothills of the Maya Mountains. Prior to this research little attention over the past 25 years has been given by previous investigators to the caverns that were located up to four kilometers away from the site core. While archaeologists from Trent University focused much of their attention on settlement within two kilometers of Pacbitun, our knowledge of the relationship between this site and the caves beyond this distance remains unclear. To date, a total of twelve caves have been identified. In the 2009 and 2010 field seasons, we surveyed four cave sites (Actun Merech, Actun Pech, Tzul's Cave, and Crystal Palace). The primary objectives of the cave research are to: 1) ascertain the different kinds of activities that may have occurred through time within the caves; 2) determine which segment of Maya society, elite or commoner, was utilizing the caves, and where did they live (site core vs. periphery) in order to gain access to them; and 3) enhance our knowledge of the role of caves at the regional level. These investigations are compared with data from other cave sites in the area in an effort to determine whether there are any inter-regional similarities or differences in cave artifact assemblages, art, architecture, and, ultimately, function.

Introduction

As McAnany (2010:3) notes, “in non-capitalist societies, economic practice tends not to rule the day but is entangled with political, social, and cosmological frames”. The ongoing archaeological survey project conducted at the ancient Maya site of Pacbitun, located in the foothills of the Maya Mountains in the Cayo District, stands as an example of these various entanglements indicative of the ancient Maya landscape, which consists of households, architecture, trade, and social stratification, usually lumped together as economics.

Therefore, when the Pacbitun Preclassic Project began investigating caves in 2009 we wanted full-scale coverage of all features (e.g., settlement, terraces, reservoirs, springs, sinkholes, rockshelters) between the core and the limestone hills in the periphery (Powis 2010). Many of these limestone hills contain one or more caves and rockshelters, and by recording all of the natural and cultural features situated in between we would be better able to reconstruct ancient Maya economics, politics, and belief systems. According to Ashmore (2008), Maya landscapes and settlement are inseparable, so why should we not try to more fully understand them through full coverage survey. Too often we tend to only focus on surface sites, caves, or other

specific features in the periphery of sites instead of connecting them as the Maya viewed their relationship. Since we are working in a region where other projects are actively engaged in doing just this, we will eventually be able to compare our data with what is being recorded in other areas of west central Belize, including the Belize River Valley, the Roaring Creek Valley, and the Vaca Plateau.

Maya Cosmology

In ancient Mesoamerican religion, the landscape was a critical concept, as the earth and all of its topographic features were considered to be alive and, as living beings, to interact in human affairs (Stone 1995:21). As Moyes et al. (2009:177) have stated, caves and mountains are especially potent places of the sacred earth, which is considered to be the primordial source of all abundance and fertility in Mesoamerican thought. In various Maya myths, the earth itself was seen as the body of a divine being (Stone 1995:21). This divine being was part of a landscape which included three components, the middle world, the underworld, and the heavens. Here, the earth is depicted as the middle world, characterized in form of a crocodilian being floating in a primordial sea. The sea, as part of the underworld, is home to supernatural beings, and its presence is manifested in

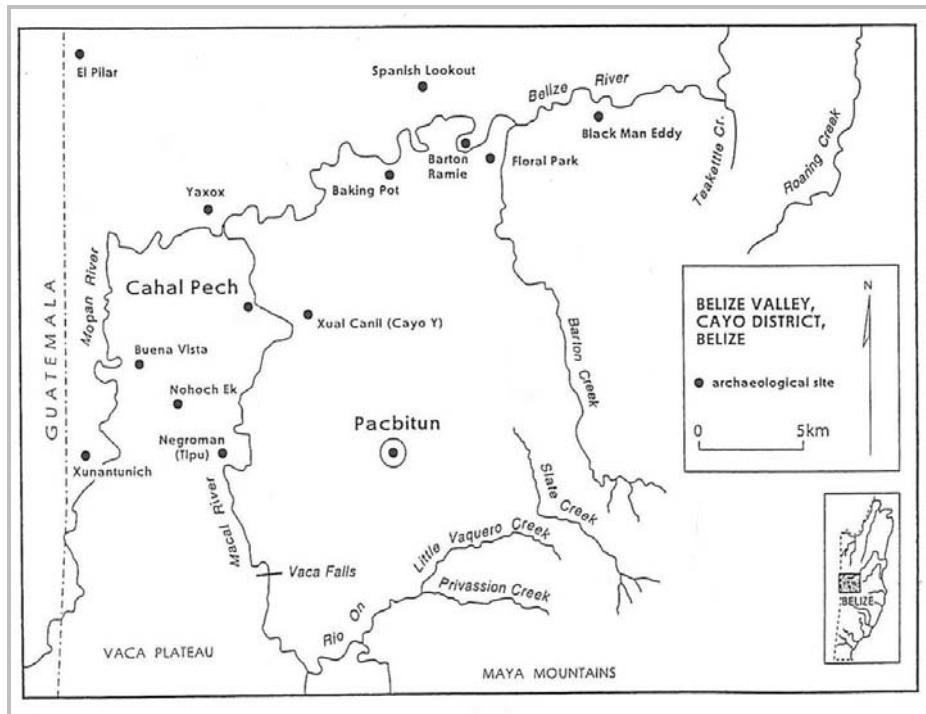


Figure 1. The location of Pacbitun along the southern rim of the Upper Belize River Valley.

lakes, oceans, cenotes, and rivers. Rivers might spill across the earth surface or flow through caves, underground. The heavens, paradise for ancestors, are also home to supernatural beings, and the Maya used the positions of the stars and planets to forecast various events like wars and alliances, and also to portray the creation myth (Ashmore 2008:171).

In association with mountains, caves were seen as houses, cosmic entry and exit points (e.g., to the underworld or Xibalba), places of transformation, and sources of fertility and material wealth, as well as sources for water (Stone 1995:34-40). The fact that many caves provide access to water sources certainly played into their significance as part of the ritual landscape. Storm clouds often emanate around mountains in which caves are located. Rain and water are very important for agriculture, particularly maize. Brady and Prufer (2005) have stated that for an agriculturally-based society, fertility is an immediate and never-ending concern in relation to crops, hence the most important elements for crops are

soil and rain which, as mentioned, often occur around mountain ranges housing caves (Brady and Prufer 2005:369). Consequently, caves and mountains were believed to house rain gods and were associated with origin myths.

Socio-Political Landscapes and Settlement

It has been argued, that for the ancient Maya, access to or control over sacred spaces and associated rituals served as a fundamental strategy for displaying, legitimizing, and negotiating social power. Here, the placement of monumental architecture over or near caves implied control over these sacred areas by the elites, who provided the financial backing for the construction of the monumental architecture (Prufer and Brady 2005). For example, while caves and cave ceremonies were used by both commoners and elites, elites could (and did in some cases) construct causeways to influence the pilgrimage to the cave (Prufer and Brady 2005). An example of this might possibly be demonstrated at the site of

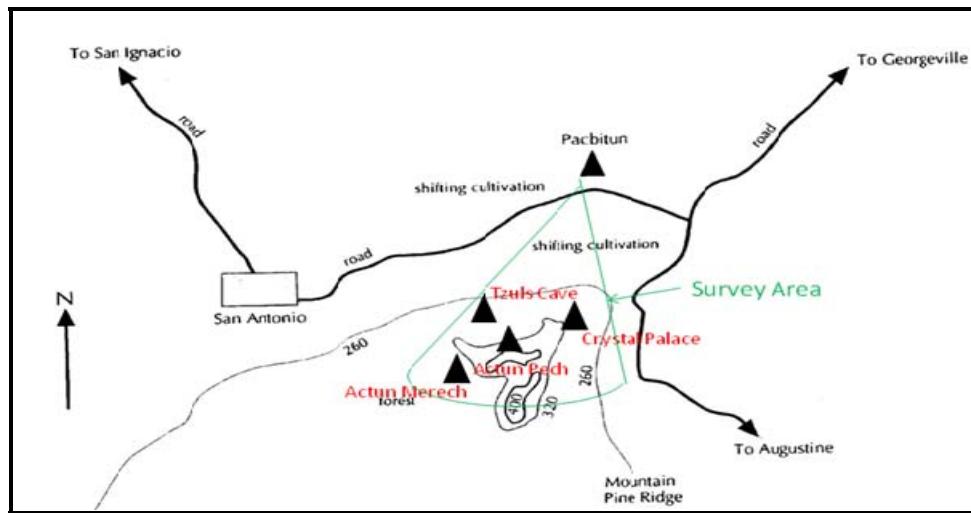


Figure 2. Survey area discussed in text (modified from Healy et al. 1996: Figure 1).

Cahal Uitz Nah in Belize. At this site, a 240 m long causeway connects the ceremonial center of Cahal Uitz Na to an associated cave named Actun Nak Beh, suggesting a controlled usage of the cave by political rule (Healy 2007). Stone (2005) argues that since caves and other topographic features have inherent powers to open communication with spirits and ancestors, and could invoke a spiritual sense of the past which could not be duplicated by the built environment, it was necessary for the elite and the commoners to renew their ties with the sources of sacred power found across the landscape. Hence, pilgrimages to these natural sanctuaries were exploited by the elite to buttress their claim of divine status (Stone 2005:135).

In addition to sacred landscape features, cave rituals can also be combined with contextual factors such as historical events or environmental conditions that may have affected ritual practice. Among the ancient Maya, ritual performances, particularly those related to water control and agricultural success, are considered to have political implications fundamental to the rise of the elite. Documented changes and characteristics of rituals in and around caves should then be able to provide information regarding the role of ritual in broader context. For example, possible external influences like political change or

environmental stress on the society (Moyes 2002).

Pacbitun

The site of Pacbitun is located in the foothills of the Mountain Pine Ridge in the Cayo District, about 3 miles from San Antonio Village (Figure 1). The site is situated at the juncture of two eco-zones: the lowland tropical rainforest and the Mountain Pine Ridge. The surrounding terrain is hilly with naturally fertile soils trapped in low-lying catchment basins and valley-like depressions. First inhabited about 800 BC (Healy et al. 2004), Pacbitun reached its peak of cultural development during the Late Classic Period (AD 600-900). At this time the site likely controlled an area of nine square kilometers. Ceramic analysis indicates that the site was possibly abandoned by the beginning of the tenth century (Healy et al. 2007).

Survey

During the 2010 field season, the goal was to survey the spatial area between the site core of Pacbitun and the three previously investigated caves of Actun Merech, Actun Pech, and Tzul's Cave. In total, an estimated area of about three square kilometers was surveyed. Due to its location near to these other caves, one newly found cave, designated as Crystal Palace, was added to the area of investigation. The

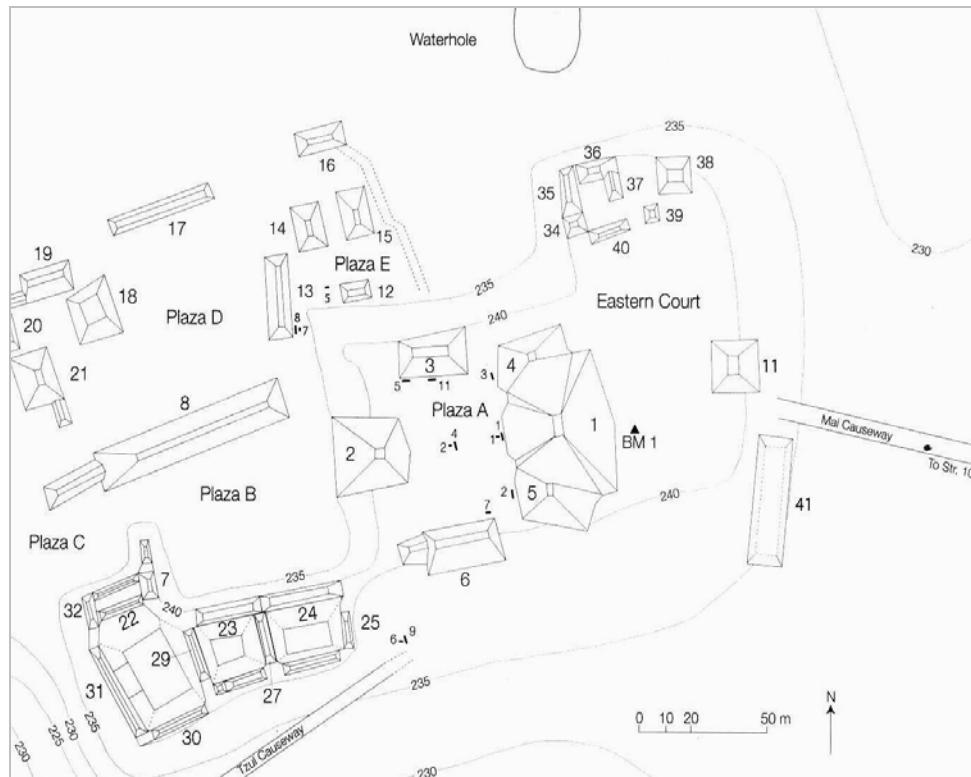


Figure 3. Pacbitun showing the Mai and Tzul Causeways to the south and east of Plaza A as separated features.

surveyed area was shaped like a pie wedge, extending from the site core towards the southwest (Figure 2). In addition to these four caves, we recorded 104 agricultural terraces, 73 housemounds, seven reservoirs, six rock shelters, four plazuela groups, two chultuns, two springs, and one sinkhole.

We also resurveyed the two causeways previously reported in the site core by investigators from Trent University (Healy et al. 2007). Healy et al. (2010) determined that both causeways, named Mai and Tzul, were separate features (Figure 3); however, the senior author was able to connect the two together. More testing still needs to be done, but, from a preliminary standpoint, it appears that the Mai Causeway changes direction from its original east-west orientation toward the southwest, passing adjacent to Structure 11 (Figure 4). Modern construction has destroyed parts of the Tzul Causeway, especially where it crosses the road, but it re-emerges clearly visible on the other side of it, as one drives back toward San Antonio Village (Figure 5).

Approximately 900 meters from the site core, Tzul Causeway intersects with another sacbe, which was named Tzib Causeway (Figure 4). It then continues into the foothills, running for about 1.2 km until it terminates in front of Tzul's Cave. Overall, visibility was good (Figure 6), but at times it was difficult to see certain sections, due to erosion, blending of it into terraces, and what appears to be a drainage constructed to keep the sacbe from flooding. In total, the Tzul Causeway is approximately 2.6 km long, and extends from Structure 10, a termini complex located in the site core, to Tzul's Cave (see Figure 5). An attempt to find a possible causeway connection between Tzul's Cave and Actun Merech, which lies approximately 900 meters to the east, produced a negative result. Tzib Causeway, which intersects with Tzul Causeway, is much shorter, only about 600 m in length, and connects a plazuela group to a minor center.

As Normark (2006) notes, causeways reflect different levels of social activity and

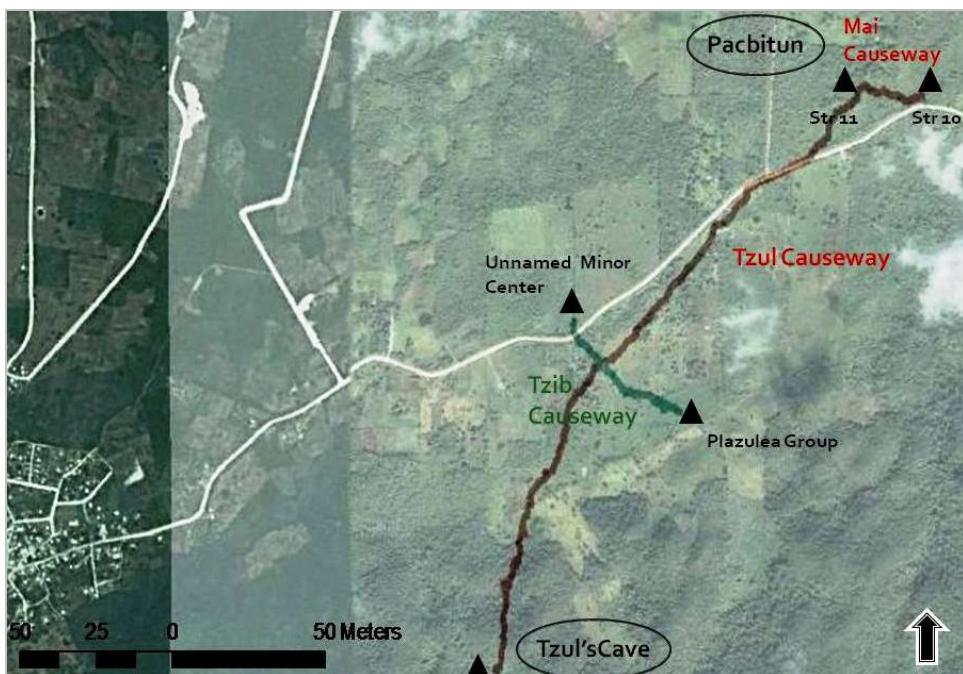


Figure 4. Map showing the recently surveyed causeway system at Pacbitun. The Mai Causeway runs from Structure 10 to Structure 11 in the site center. The Tzul Causeway runs from Structure 11 to Tzul's Cave. The Tzib Causeway runs from a plazulea group to a Termini Complex in the site core.



Figure 5. Map shows a portion of the Tzul Causeway which runs from the site core located in the north to Tzul's Cave located approximately three kilometers to the south.



Figure 6. View of the Tzul Causeway shown re-emerging from under the San Antonio Road near the site core.

meaning in the past, as roads do today, from single human agents to hierarchical relations between centers. Studying them can provide insights into political activities, social organizations, economics structures, and cosmological values on a site and regional level (Normark 2006). The further investigation of the sacbe system in the periphery of Pacbitun will hopefully provide us with some of these insights and make a substantial contribution to our understanding of how ritual behavior and pilgrimages influenced settlement patterns or visa versa.

Cave Description

The preliminary survey results and descriptions of Actun Merech, Actun Pech, and Tzul's Cave have already been discussed elsewhere (Powis 2010), therefore only a description of Crystal Palace is needed here. This cave is located to the south of Pacbitun and lies approximately 0.5 km to the northeast of Actun Pech, 0.9 km to the northeast of Actun Merech, and 1.3 km to the east of Tzul's Cave (see Figure 2).

Crystal Palace

As mentioned, Crystal Palace is located south of Pacbitun to the east of Actun Pech, Actun Merech, and Tzul's Cave. This cave has not yet been mapped and all measurements are preliminary in nature.

Outside of the cave is a single house mound located 15 m to the northwest of the entrance. Surface collection on top of the mound yielded three Late Classic pottery sherds.

The entrance of the cave is relatively large compared to those already surveyed in the periphery of Pacbitun. It measures about 4 m by 2 m in size (Figure 7). Once inside, one descends two meters into a large, open main chamber. The entrance gradually slopes downward, allowing access to more than one person at a time (Figure 8). From the main chamber, one can see that the cave is v-shaped. It measures 55 m in length, with a height of about 4.5 m, and a width of 17 m. Inside, two architectural stairs were found, as well as numerous caches of vessels (broken plates, bowls, and ollas), and broken stalactites and stalagmites, suggesting a possible relation to ritual usage, as well as water collection and/or food offerings to Maya deities (Healy et al. 1996). Two caches, containing numerous Late-to-Terminal Classic vessels, were placed beneath roof collapse in two separate locations within the cave (Figure 9). Overall, this cave is covered with an abundance of stalactites and stalagmite formations, as well as sherd deposits in various different locations, including niches which are very difficult to access (Figure 10). Room names



Figure 7. View of the entrance of Crystal Palace.



Figure 9. View of cache inside Crystal Palace.



Figure 8. View of the main chamber inside Crystal Palace.



Figure 10. View of pottery deposit in niche inside Crystal Palace.

still have to be assigned to Crystal Palace; however, it can be said that the chamber system seems to be rather uncomplicated, with relative large and open rooms. A number of small ledges and niches are still to be explored. Thus far, no animal or human remains have been found.

In addition, the single house mound located immediately outside the entrance leaves us with many unanswered questions. What was its function? Does it have a religious connection to the cave or was it simply constructed for residential purposes? Did it function as a guard or watch tower, to restrict access to different segments of Maya society? As mentioned earlier, it has been argued that the placement of architecture over or near a cave can imply control over the sacred space by the elite (Prufer and Brady 2005). If this is the case at Crystal Palace, why haven't we found similar remains of architecture next to one of the other caves? What made this one different? Further archaeological investigations in and

around Crystal Palace, as well as some of the other caves in the periphery, will hopefully help us to answer some of these questions.

Conclusion

In sum, we have just begun to conduct extensive research in the periphery of Paibitun. We hope in the near future to be able to better understand the relationship between the different natural and cultural features at the site as well as between sites across this region of west central Belize. Preliminarily, we have found new minor centers, plazuela groups, agricultural terraces, and reservoirs, some of which are interconnected (meaning they drain one into another when they get overfilled). We have causeways, one extending up to 2.6 kilometers from the site core where it terminates at a cave. As Normark (2006) mentions, long causeways may have had some additional features assigned to them, for example lodging and storage areas or

shrines. Upon further investigation, it will be interesting to see if we can identify such features in association with the Tzul Causeway. Other additional research involves the relationship between causeways and caves. Some of this involves least cost analysis, as well as other predictive modeling techniques. Why, for example, is one cave connected to the site core when others aren't? How were the others caves accessed then? Where are the trails or paths leading to these other caves? Are these trails located along the base of hills? This is an interesting question since the Tzul Causeway that extends from the site core to Tzul's Cave traverses many small hills. Were there assigned trails exclusively utilized by elites and commoners?

Also, due to its close relationship to an abundance of caves (15+ in one section of a three km area), this raises the question about the role of Pacbitun in a religious context. Paul Healy (2007) has noted that the site might have been originally founded around 800 BC for its access to not only good agricultural lands, but also to granite and slate sources located nearby. However, the senior author has proposed an alternative founding of the site for religious reasons. Obviously, this is something that needs to be tested. At present, we mostly have usage of the caves around Pacbitun, dating mainly to the Late to Terminal Classic period. Actun Pech has Late Preclassic ceramics, but Pacbitun was founded around 800 BC. We will need much earlier occupation of the caves if we want to be able to state that the site was founded for religious purposes.

We are also interested in the relationship between minor centers and caves in the periphery of the site core. We have one minor center, called Pol Sac Pac, which is situated on top of a hill, the highest in the area. Below the site is a cave located halfway down the hill. Below that is a spring and below that is a series of interconnected reservoirs. And settlement is dense in this area. In conclusion, there are many areas of research to focus on in the periphery of Pacbitun over the next few years, and we look forward to comparing our results with

those projects in the region with similar interests.

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17 PRECERAMIC TO POSTCLASSIC: A BRIEF SYNTHESIS OF THE OCCUPATION HISTORY OF GROUP E, XUNANTUNICH

M. Kathryn Brown, Jennifer Cochran, Leah McCurdy, and David Mixter

Recent investigations at the site of Xunantunich's Group E have documented a long history of occupation at this location beginning as early as the Preceramic period and continuing through the Postclassic. The Mopan Valley Preclassic Project has investigated this location for the past three field seasons and has documented some exciting and unexpected discoveries. The monumental architecture in this group appears to have been initially constructed as early as the Middle Preclassic and rebuilt in the Late Preclassic with evidence of Protoclassic ritual use. Evidence of re-occupation in the Late Classic has been encountered as well as craft production loci. Postclassic ritual activity has also been documented, indicating the continued importance of this special location on the ancient landscape. In this paper, we discuss some of the latest finds from Xunantunich Group E and our preliminary interpretations, while presenting an updated chronology for the group.

Introduction

Despite nearly a century of archaeological investigation, little is known about the Preclassic occupation of Xunantunich, Belize. This understudied occupation is the focus of the Mopan Valley Preclassic Project (MVPP) investigations at Xunantunich. Previous seasons of investigation (LeCount et al. 2002, LeCount and Yaeger 2010) largely confirm the findings of earlier projects that evidence of Preclassic occupation within the Xunantunich site core (Groups A through D) is limited. A Preclassic ceremonial center, however, has been documented only 800 meters from the site core, at the complex consisting of Group E and O/A2-1. Recent investigations at Group E have not only documented relatively large Preclassic architecture (Brown 2009, 2010; Robin et al. 1994), but also a long history of occupation beginning in the Preceramic period and extending to the Postclassic.

MVPP began investigating Group E in 2008 as part of its larger program of documenting and understanding the development of political authority in the Mopan Valley during the Preclassic period. As with all archaeological investigations, research often yields unexpected data and leads to new questions and avenues of research. For example, Postclassic ritual features were discovered at Group E during the 2008 field season (Brown 2010), which led to new questions about the use of

abandoned Preclassic architecture as the focus of Postclassic ritual behavior. These new data also demonstrated a remarkable longevity of ancient Maya ritual behavior and, more specifically, the ancestor veneration focus of Postclassic rituals (Brown 2010). Other exciting and unexpected discoveries at Group E include a Late Classic craft workshop and an underlying Preceramic occupation. In this paper, we discuss some of the latest finds from Xunantunich Group E and our preliminary interpretations, while presenting an updated chronology for the group.

Excavations at Group E

Group E and the related architectural group of O/A2-1 are located on a limestone terrace overlooking the Mopan River, approximately 800 meters east of the Late Classic site core of Xunantunich (Figure 1). These two architectural groups make up the ceremonial core of a large Preclassic center. Group E consists of two Preclassic pyramids, Structures E-1 and E-2, framing the western and eastern sides of a large sloping plaza, Plaza E (Figure 2). MVPP excavations indicate that both structures were initially constructed by the Middle Preclassic period. These early pyramids are associated with an enormous platform located to the northeast measuring 100 meters north-south by 115 meters east-west and 13 meters high on its tallest side (Robin

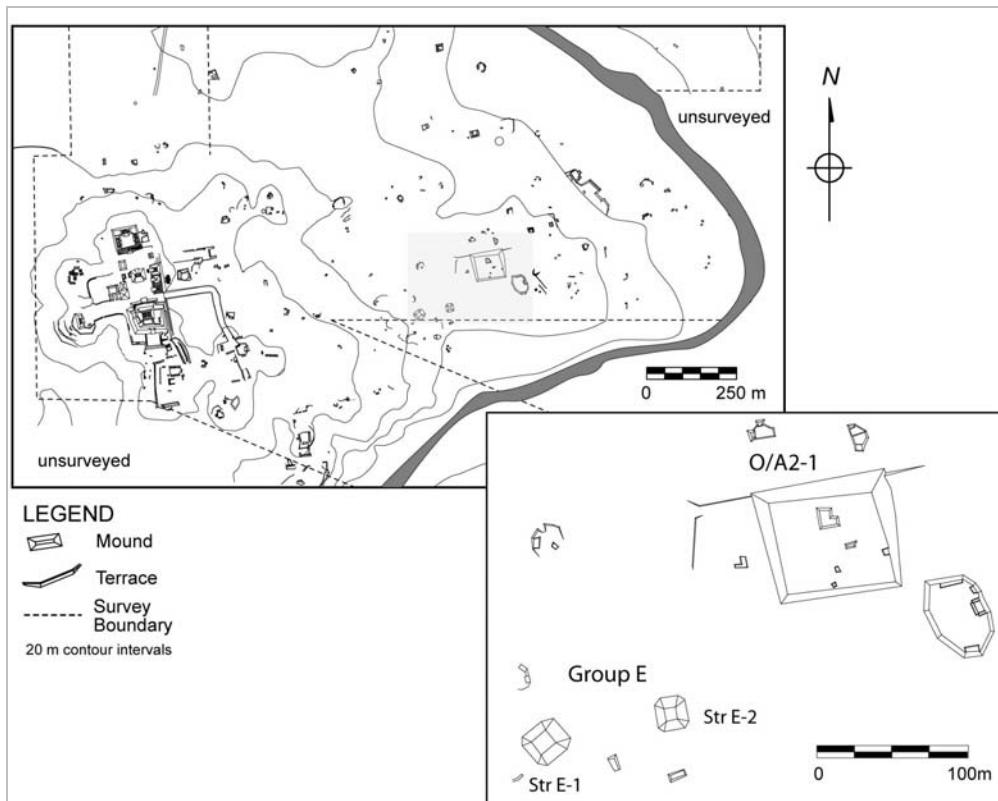


Figure 1. Map Showing Xunantunich Site Core and Group E.

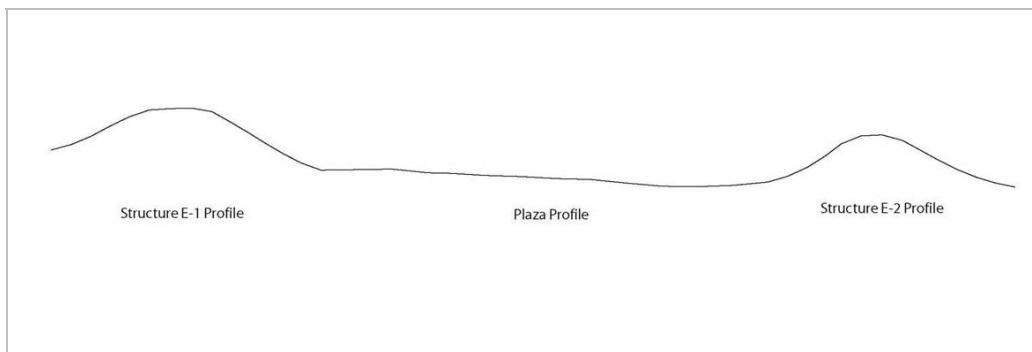


Figure 2. Section Drawing of Structures E-1, E-2 and Plaza E.

et al. 1994). Test excavations conducted by Xunantunich Archaeological Project (XAP) in 1994 indicated that the final construction phases of this large platform also date to the Middle Preclassic.

Since 2008, Group E has been the focus of MVPP investigations at Xunantunich. Several initial goals guided our excavations. First, we wanted to understand the chronology of this locus, from its initial occupation to its final abandonment.

Second, we wanted to define the form and orientation of both the eastern and western pyramids (Structures E-2 and E-1 respectively). These data would lay the foundation for future intensive stripping excavations of both pyramids. Third, we wanted to conduct excavations in the sloping plaza between Structures E-1 and E-2 to identify a stairway, ramp, or other features connecting the two pyramids, as well as investigate any buried architecture or

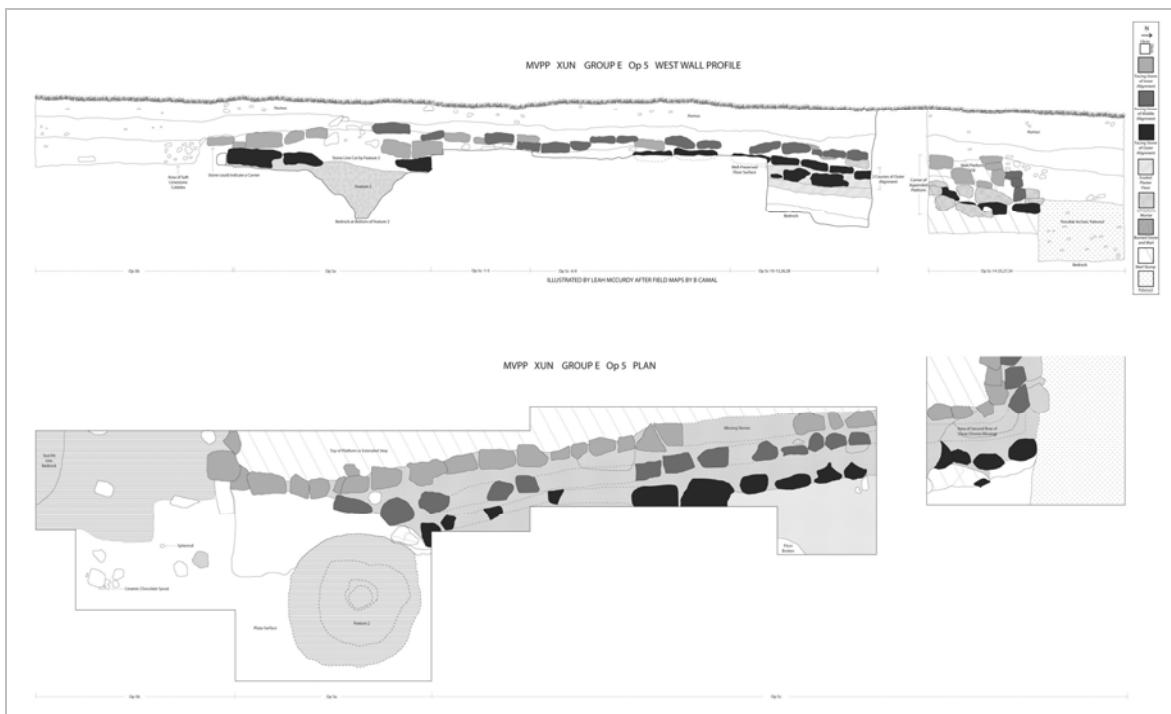


Figure 3. Profile and Plan Map of Excavations at the Base of Structure E-1 (Operation 5).

features that may predate the pyramids. Through data collected over the past three field seasons we have learned a great deal about the chronology of the site, identified buried architecture features in the plaza, and reconstructed the basic form of the pyramids. These data are synthesized below.

The investigations by XAP (Robin et al. 1994) and the initial work conducted by MVPP at Group E in 2008 (Brown 2009) found architectural features dating as early as the Middle Preclassic. MVPP recently has pushed the initial occupation of the site back by identifying remains from the Cunil (ca. 1200-900 BC) and Preceramic periods. While Cunil ceramic sherds have been recovered from mixed deposits at several locations within Group E, we encountered likely Cunil features beneath a Middle Preclassic platform in the center of Plaza E. Our excavations of the surface of the platform revealed a cut in the summit. Partial excavation of the cut revealed two features roughly one meter below the platform's summit. The first of these was an eroded tamped marl surface. The presence

of a few Cunil sherds under this surface and the absence of any later materials suggest a very early date for the feature. This surface overlies a circle of cobbles that resembles a simple crypt, but time constraints forced us to postpone fuller investigations of this feature. A Cunil occupation at Group E is not entirely surprising, as XAP encountered a significant deposit of Cunil ceramic material buried under the Castillo in the site core.

We were, however, quite surprised to find a Preceramic occupation at the site. Our 2009 excavations revealed a buried paleosol to the north and beneath the northern basal corner of Structure E-1 (Figure 3). This sticky, black layer sat directly above bedrock, and it contained highly patinated lithic material. The over 50 centimeter thick layer was notable for the absence of ceramics, as only three small sherds were found at the top of this level. The absence of ceramic material and the presence of fragments of a limestone dish suggested to us that this layer dated to the Preceramic period, and two AMS radiocarbon dates confirm this. The

lowermost sample (Beta-275307) was collected directly above bedrock and the results yielded a Conventional radiocarbon age of 4410 ± 40 BP and 2 sigma calibrated results of Cal BC 3320 to 3230 (Cal BP 5270 to 5180) and Cal BC 3110 to 2910 (Cal BP 5060-4860). The uppermost sample (Beta-275306) was collected at the top of the level and it yielded a Conventional radiocarbon age of 2890 ± 49 BP and 2 sigma calibrated results of Cal BC 1210 to 970 (Cal BP 3160 to 2920) and Cal BC 960 to 940 (Cal BP 2900-2890) which corresponds nicely with the earliest dates of the Cunil phase at nearby Cahal Pech (Awe 1992; Sullivan et al. 2010) and the Kanocha phase at Blackman Eddy (Brown 2003; Garber et al. 2004).

In 2010, we placed a 2 x 2 meter unit several meters to the east of the excavation unit where we first encountered the paleosol to examine the horizontal extent of the stratum. In this unit, we hit a hard packed marl layer that we originally thought was bedrock. We were surprised not to find the paleosol, and we decided to excavate through the would-be bedrock. After picking down for over 60 centimeters, we finally hit the black, sticky matrix. The paleosol was buried under what MVPP fondly refers to as “fools” bedrock. As in our earlier unit, we found only a handful of sherds within the first few centimeters of the paleosol, in this case Middle Preclassic Savanna Orange sherds and a few possible Cunil sherds, and a very high density of highly patinated lithic artifacts. We excavated a 1 x 2 meter area of the unit down 5 centimeters into the paleosol, at which point we encountered an intact fire-cracked rock feature. As this interesting find was discovered on the last field day, its fuller investigation was to be postponed until the 2011 field season. The matrix from the paleosol was processed through floatation and both heavy and light fraction were collected for micro-artifact and micro-botanical analysis.

The presence of a Preceramic occupation at Xunantunich Group E is quite interesting and important. Group E is one of

the few locations in the Maya Lowlands where deposits from this early time period are found stratigraphically underlying Early and Middle Preclassic occupations. Due to the lack of stratigraphic continuity between the Preceramic Period (3500 -1200 BC) and the Early Preclassic Period (1200-900 BC), our understanding of this critical transition period in the history of the Maya lowlands remains limited (Lohse 2009, 2010; Lohse et al. 2006). Although the Early and Late Preceramic time periods have been investigated elsewhere in Belize (Hester et al. 1996; Iceland 1997; Rosenswig 2004), little is known about the Preceramic in the Belize River valley. Evidence from Cahal Pech and Blackman Eddy have provided a much better understanding of the earliest ceramic using occupation (Awe 1992; Brown 2003; Garber et al. 2004; Sullivan et al. 2009), but in situ Preceramic layers have not been documented at either site. Further investigations of the Preceramic occupation at Xunantunich Group E should allow us to better understand the origins of settled agricultural lifeways in the Belize River Valley and the lowlands more broadly.

Excavations at Structure E-2

As discussed above, another goal of MVPP’s research at Group E is to understand the form and orientation of the eastern and western pyramids (Structures E-2 and E-1) that frame the sloping plaza (Figure 2). Structure E-2 has been the focus of most of our investigations to date (see Brown 2009, 2010), while limited work has been conducted on Structure E-1. Our excavations have been designed to gather essential information about the structures to set the stage for more intensive stripping excavations planned for the near future. The flat topped form and squat nature of both structures suggests the possibility that deity masks flank their central staircases. Excavations of Structure E-2 uncovered at least two distinct construction phases dating to the Preclassic (Figure 4). The terminal construction phase (Structure E-2-1st) dates to the Late Preclassic and was badly preserved, distinguishable only by a

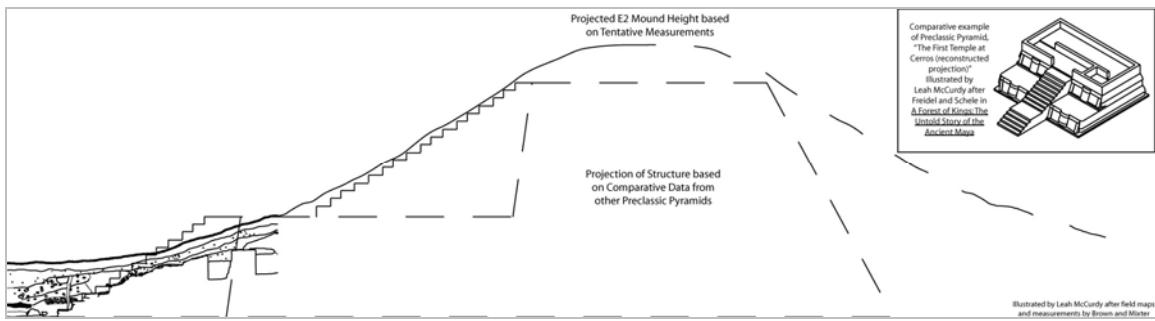


Figure 4. Section of Structure E-2 Showing Excavated Stratigraphy (Operation 2) and Hypothetical Form of Structures E-2-1st and E-2-2nd.

distinctive rubble fill. The facing stones of the excavated portion of the stairs were robbed in antiquity and probably used in nearby Late Classic architecture. In fact, we did not find a single facing stone left intact associated with this phase.

Fortunately, the penultimate phase, Structure E-2-2nd was much better preserved. This phase appears to date to the Middle Preclassic based on a small ceramic sample retrieved from excavations that penetrated the lower terrace. The basal three steps of this phase were intact, but the upper stairs and terraces were only distinguishable by a thick, wet-laid, white marl fill, indicating that the stone robbing was not limited to the final phase. However, the fact that the lower treads were deeply buried beneath almost 2 meters of plaza fill and natural sediment buildup likely accounts for their preserved state. Our excavations revealed that the central staircase of Structure E-2-2nd was somewhat unusual. The lowermost portion of the staircase was inset into a small terrace, while the mid-section of the staircase was outset from the pyramid (Figure 5), similar in form to Structure B4 at the nearby site of Cahal Pech. We also encountered a possible posthole in front of the structure suggesting the presence of a small perishable feature of some form, possibly a wooden altar. A smashed partial Savanna Orange chocolate pot was found on the lowermost steps, a finding that further supports a Middle Preclassic date for Structure E-2-2nd (Brown 2010).

Investigations of the western pyramid (Structure E-1) were initiated in 2009. Initial excavations focused on the basal portion of Structure E-1 in order to examine the basal wall and locate the corners of the structure (Figure 3). We also conducted penetrating excavations in front of the pyramid to gain a better understanding of the plaza chronology and to look for associated features and caches. Although we do not fully understand the form of the structure to date, discovery of the frontal wall of the structure and the northern corner provide information about the orientation of the pyramid. Unfortunately the location of the central staircase and the southern corner of the structure were not defined due to time constraints.

A curious feature was encountered in front of the pyramid, placed along its approximate centerline axis. A circular pit was cut through the basal step of the final phase (Structure E-1-1st), penetrating through the associated plaza surface extending down into bedrock (see Figure 3). The pit was filled with fire-cracked rock and its sides and the adjacent stones of the Structure E-1-1st stairway exhibited evidence of severe burning. This pit may indicate some form of later ritual activity at this location, as it clearly postdates the structure. Both Late Classic and Postclassic sherds were found on the surface nearby. It is interesting that it was placed directly across the plaza from an Early Postclassic altar that was erected in front of Structure E-2 (Brown 2010), suggesting a possible association. Investigations during the 2009

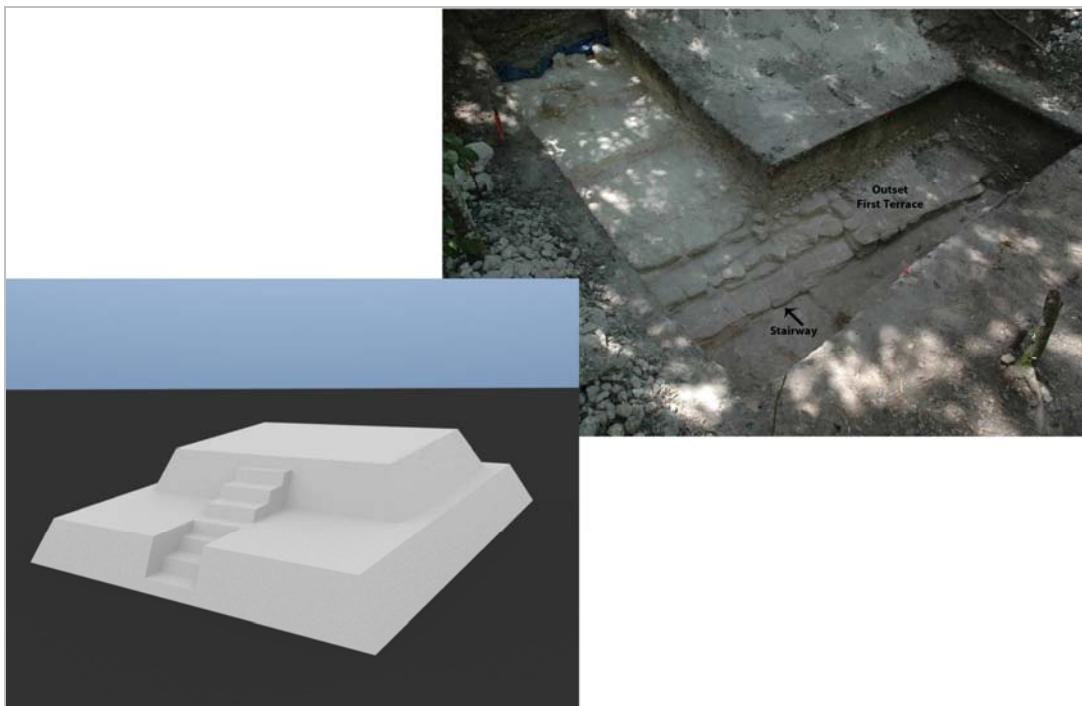


Figure 5. Structure E-2-2nd Photo of Basal Steps and Isometric Reconstruction Drawing.

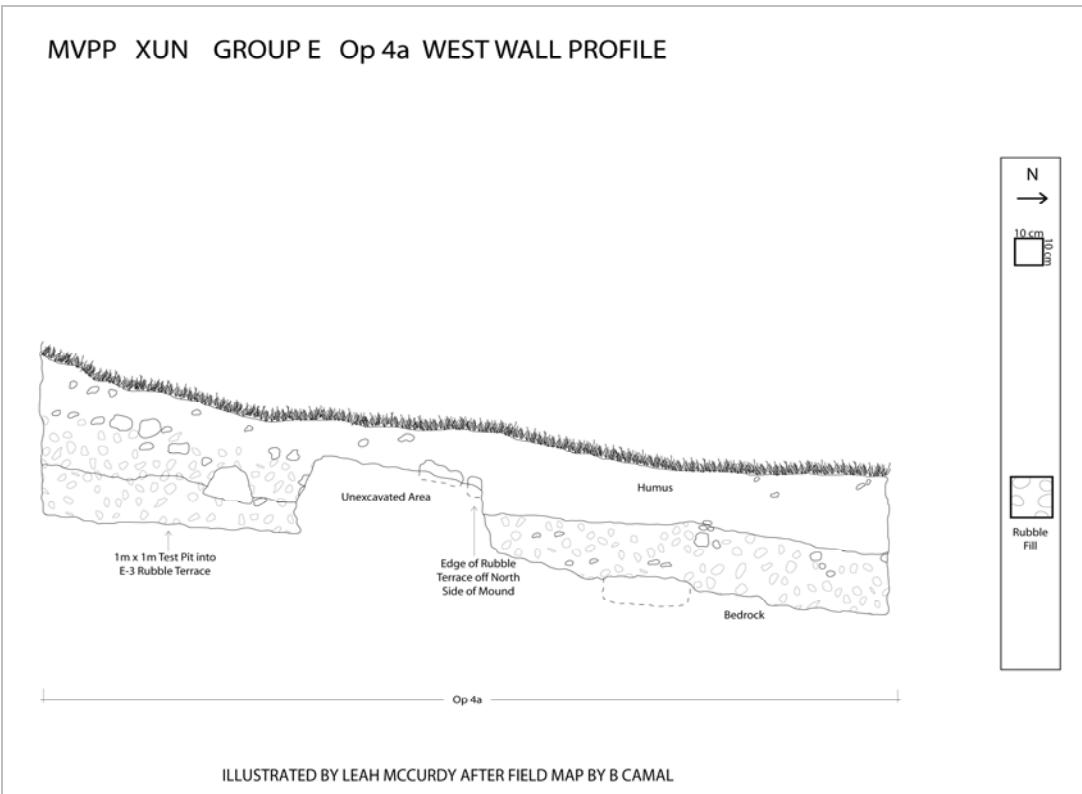


Figure 6. Profile of Northern Terrace of Structure E-3 (Operation 4).

field season encountered evidence that Group E was re-occupied during the Late Classic period, with limited activities continuing into the Early Postclassic (Brown 2010), as mentioned above. The Late Classic occupation included several new construction efforts. For example, Structure E-3 is a small mound oddly placed just south of the center of Plaza E between Structures E-2 and E-1 (see Figure 1). Excavations revealed that the fill of this building was constructed of medium to large cobbles, and that it dates to the Late Classic period (Figure 6). From its size and shape, Structure E-3 likely was a Late Classic house platform, suggesting some residential use of this location during the height of the Xunantunich polity. What is intriguing, however, is that the monumental architecture of Group E was never rebuilt after it was abandoned at the end of the Late Preclassic, despite later occupation in the area.

Further evidence of Late Classic occupation was encountered in the plaza in front of Structure E-2 during the 2009 field season. Directly beneath the ground surface, we encountered thousands of chert flakes and micro-drills suggestive of craft production location of some type. A high percentage of the flakes recovered were snapped in a fashion to provide sharp and pointed edges that would have allowed them to be used in a similar fashion to micro-drills. In addition, we recovered hundreds of micro-drills made by retouching chert prismatic blades. Both artifact types exhibited use wear on the edges and appear to have functioned as gravers.

In 2010 we expanded the excavations of this area to reach a 6 x 2 meter area and, in addition, opened a second 4 x 2 meter area adjacent to this. Our goal was to expose more of the lithic concentration, collect flotation samples in order to examine the heavy fraction for micro-artifacts that would shed light on the function of the flakes and micro-drills, and look for any ephemeral architectural features associated with the deposit. Tens of thousands of flakes and



Figure 7. Image of Carved Stone Figure.

micro-drills were collected and exported to the University of Texas at San Antonio for analysis. We collected micro-artifact samples from all plaza excavation units as well, to look for fragments of materials that may have been engraved. It is worth noting that similar flakes and micro-drills were encountered in the top levels of all excavation units in the Group E plaza. While the density of lithic material is not as high in other areas of the Plaza E, the thousands of artifacts recovered suggest that the craft production was not limited to one small locus. While the full results of these analyses are still pending, initial assessments suggest that Group E was the location of one of several Late to Terminal Classic craft production workshops discovered to date in and around Xunantunich.

For example, at Group D in the Xunantunich site core, Jennifer Braswell (2010) documented a Late Classic slate carving workshop. The lithic artifact assemblage from Group D is similar to that of Group E, with high frequencies of drills-on-blades with unifacial retouch (Braswell 2010). Braswell documented a total of 276 pieces of slate, 51 of which were modified. Although this may seem like relatively few pieces of slate when compared to the number of prepared drills present at Group D (almost 2,000), this is a fairly high frequency of slate pieces compared to other

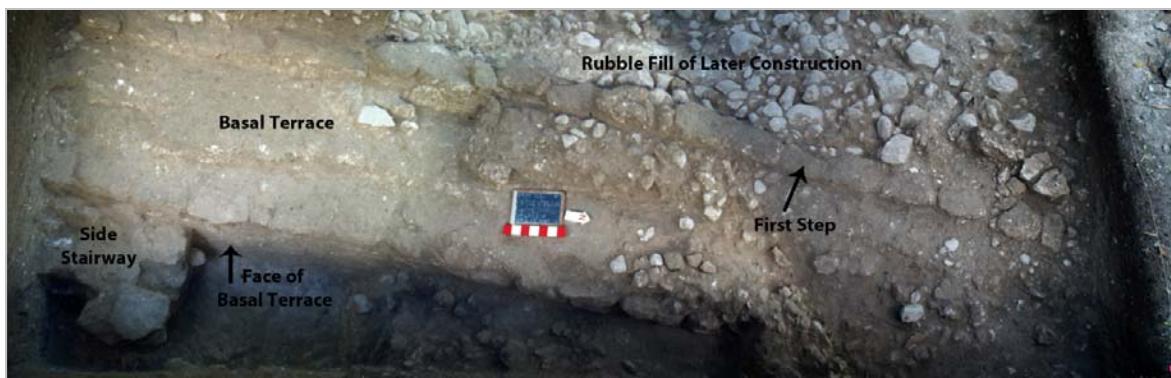


Figure 8. Overview Photo of the Basal Portion of Plaza E Stairway.

areas of Xunantunich. Braswell (2010) argues that the scale of slate production at Group D was fairly small and that these craft products may have been intended as gifting items to nobles outside of Xunantunich.

At Group E, several pieces of unworked slate were found within our excavations, but we have not encountered any modified slate as of yet. We also did not encounter strong evidence of other raw materials that could have been worked, such as marine shell. A small carved stone figure was recovered, however, only one such artifact was found and it was in a finished state (Figure 7). The paucity of large pieces of raw material and worked artifacts of stone or shell, particularly in light of the large numbers of chert tools, may indicate that perishable materials were being worked, such as wood or gourds. Archaeologists often think of craft specialization in the terms of the raw materials being worked because that is often how we classify artifacts. However it might be more appropriate to consider craft specialization in light of the techniques and skills that the artisans use, such as engraving. Such skills can be applied to a variety of raw materials, some of which may have been perishable. Therefore, it might be possible that several types of raw materials were being worked.

Furthermore, Randolph Widmer (2009) has shown that the raw materials used in craft production can be difficult to identify as the production often leaves only micro-debitage. Whereas traditional excavations methods typically overlook micro-debitage ,

we targeted collection of micro-artifact samples and hope that their analysis will provide us with data pertaining to the types of raw materials being worked. We also plan to conduct usewear analysis of the engraving tools. We are also interested in exploring why a craft workshop was placed directly in front of an abandoned Preclassic pyramid. This placement is curious and lead us to speculate that this location held ritual significance to the Late Classic artisans and may have been used for engraving sacred artifacts (see also Widmer 2009).

As discussed above, another of the MVPP initial goals at Group E was to investigate the sloping plaza between Structures E-1 and E-2 in order to identify a stairway, ramp, and/or other features connecting the two pyramids, as well as reveal any buried architecture or features that might predate the pyramids. After exposing the Late Classic craft production locus in the plaza in front of Structure E-2, we decided to continue down in a portion of this operation to look for such features. We suspected that there would have been either a ramp or steps between the two pyramids due to the sloping nature of the plaza. We encountered the base of what appears to be a large plaza stairway approximately 3 meters in front of Structure E-2. This monumental stairway appears to have been modified at least twice. A basal wall was encountered that was at least eight courses high (Figure 8). This wall formed a basal terrace onto the surface of which a wide central staircase was placed.

On the south side of the unit, we encountered a side staircase that would have allowed access to the top of the basal terrace (Figure 8). This feature was badly preserved and not fully exposed during the 2010 field season; additional excavations in this area are planned for the 2011 field season. The small side staircase, however, does suggest that access to Structure E-2 from the plaza was somewhat restricted. Assuming symmetry, there would have been a northern side staircase as well. Our current understanding of this unique monumental stairway is that two small side staircases (one on the southern and northern sides) provided access to a broad, elevated terrace in the plaza. This terrace led to a series of long, low steps that extended over the entire width of the plaza in front of Structure E-2. On the third riser of the final phase of the staircase, we encountered a highly eroded plaster feature that we suspect was a badly preserved plaster deity mask. Unfortunately, both the feature and the final construction phase of the staircase were poorly preserved and, like the final phase of Structure E-2, the facing stones had been removed in antiquity.

We did find an interesting deposit above the terminal phase of the stairway. A layer of smashed Protoclassic vessels was found within a layer of cobbles. Fragments of numerous Aguacate Orange mammiform tetrapod dishes and Aguacate Orange jars, as well as several partial Sierra Red vessels and ring bases were present. This assemblage has not been fully examined as it was found at the end of the 2010 field season. I do think this will be an interesting deposit as many of the vessels appeared to be halved and/or quartered, similar to several Preclassic problematic deposits at the site of Blackman Eddy (Brown 2007, 2008).

Conclusion

The last three years of investigations at Group E have provided us with a better understanding of the occupation history at this location. Evidence suggests that the site was initially occupied in the Preceramic period. Although it is not clear if there was

continuous occupation, there is evidence of an Early Preclassic (Cunil phase) occupation as well. The monumental architecture at Group E appears to have been initially constructed during the Middle Preclassic and abandoned at the end of the Late Preclassic. This, however, does not mean that Group E did not continue to be an important and sacred place on the landscape. Protoclassic ritual activity has been uncovered, as well as a Late Classic occupation and specialized craft production loci. Group E continues to be important through the Early Postclassic as evidenced by a modest altar located in front of the easternmost pyramid, Structure E-2 (Brown 2010). Our research has led to many new and exciting questions for future investigations. From the Preceramic to the Postclassic, this location was clearly important to the ancient Maya of the Mopan Valley and had a long and interesting occupation history. The new discoveries are both thought-provoking and challenging and promise to shed light on some important issues and debates in Maya archaeology.

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18 AN ARCHITECTURAL HISTORY OF PLAZA A-III AT XUNANTUNICH

Leah McCurdy, Jason Yaeger, and M. Kathryn Brown

Plaza A-III at Xunantunich provides an interesting case study for understanding the construction history of a palace using traditional architectural reconstruction and the high tech methods such as computer aided design (CAD) and virtual reality (VR) software. Plaza A-III has been the focus of archaeological investigations beginning with Thomas Gann in the early 1900's. Recent work by the Xunantunich Archaeological Project, Tourism Development Project, Xunantunich Palace Excavations, and the Mopan Valley Preclassic Project have built on earlier work to assemble a data set that allows us to create a detailed reconstruction of the development of this important architectural complex. This paper pays particular attention to the ways that the changing configuration of the palace reveal changes in function, access, viewsheds, and use of space within the palace, which in turn reflect developments in the nature of royal authority at the site.

Introduction

This article presents a brief synopsis of our current understanding of the history of Plaza A-III at Xunantunich. This is the site's northernmost architectural complex (Figure 1), and it is widely interpreted as a residential and administrative complex that served as the seat of the site's ruling court, at least for part of the Late Classic Hats' Chaak phase (Yaeger 2010). In this article we synthesize data collected by four different archaeological projects to chart Plaza A-III's architectural history, describe its abrupt construction and subsequent partial destruction during the Hats' Chaak phase (AD 690–780), and discuss the implications of this data as to the changing nature of rulership at Xunantunich. Second, we discuss the application of new virtual reality methodologies and technologies, including virtual reconstruction, to Plaza A-III (Figure 2). We believe that virtual reconstructions and their application in interactive software hold great promise as archaeological research tools.

Architectural History of Plaza A-III

Plaza A-III has been the focus of archaeological investigations since Thomas Gann's work there in the early 1900s. Since 1991, investigations by the Xunantunich Archaeological Project (XAP), Tourism Development Project (TDP) and affiliated Xunantunich Palace Excavations (XPE), and the Mopan Valley Preclassic Project

(MVPP) have built on the foundations put in place by Gann, Euan Mackie, and other scholars to create a data set that allows us to reconstruct in some detail the development of this important architectural complex.

In 1997, XAP test excavations revealed Middle Preclassic sherds just above bedrock. In 2008, MVPP, directed by M. Kathryn Brown, returned to Plaza A-III to investigate these Preclassic deposits through trenching excavations on the eastern and northern side of the plaza (Figure 3). After peeling back several Late Classic plaza floors and fill episodes, the MVPP excavations revealed two earlier phases of modest constructions. The earliest cultural material in these excavations dated to the Middle Preclassic, confirming the XAP findings mentioned above. It is uncertain if the earliest construction also dates to that period.

The earliest architectural feature in the MVPP excavations consists of modified bedrock discovered at the western end of the trench in front of Structure A-12, where a series of rough steps were cut into bedrock (Figure 4). Although we found no postholes or other evidence of an associated superstructure, we propose that these steps were part of a low platform, plausibly a residence. Because this feature was overlaid by a fill episode containing mixed Preclassic ceramic materials, it is impossible to date with precision. Given the presence of Middle Preclassic sherds, we suspect the feature dates to that period. A Middle

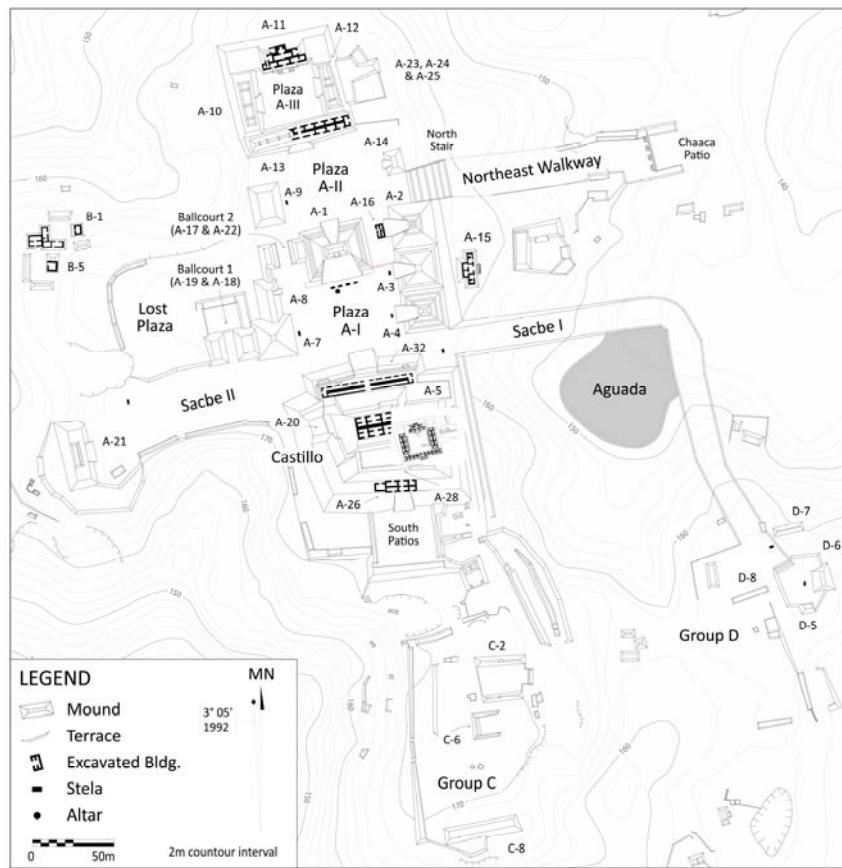


Figure 1. Plan of Xunantunich, Belize.

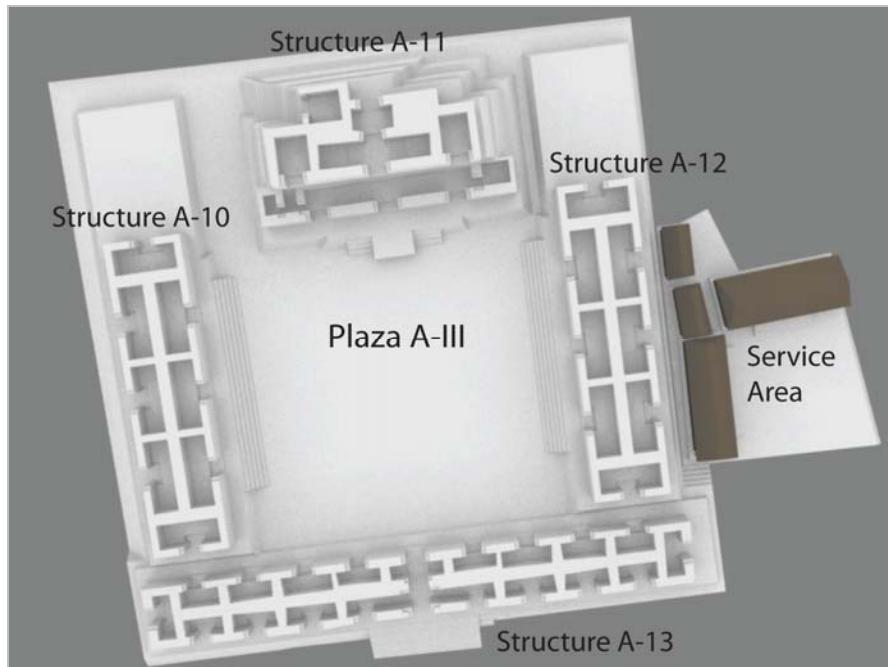


Figure 2. Hypothetical floor plan of Plaza A-III. Drawing by Leah McCurdy following Yaeger 2010: Fig. 7.1.

Preclassic (or earlier) platform was found in XAP tunneling excavations beneath the Castillo, and Middle Preclassic features have been found elsewhere on the Xunantunich ridge top (LeCount and Yaeger 2010b).

A modest Early Classic rectangular platform later was placed above the modified bedrock steps (Figure 5). This low platform was constructed of small to medium sized rubble and did not exhibit a formal plastered surface. The extent of this platform and any other architectural features that might have existed in this location in the Early Classic, are as of yet undefined by excavation. It is curious to note however, that an Early Classic platform was also encountered in the XAP excavations under the Castillo (LeCount and Yaeger 2010b), indicating a similar chronology at these two locations. The platform found under the Castillo, however, was much larger in size (2 meters in height) suggesting more labor investment. The markedly more humble construction buried within Plaza A-III may represent the platform of a simple residence. Although the data is limited to date, we can confidently state that Plaza A-III is part of a relatively modest settlement on the Xunantunich ridge-top that begins as early as the Middle Preclassic. Its inhabitants likely were tied to the much larger and more formal Middle Preclassic ceremonial complex at Group E and O/A1-2, 800 meters to the east (Brown 2010; Brown *et al.* this volume). Plaza A-III is one of a few loci on the ridge top that show Early Classic occupation, together with the larger 2-meter high platform buried under the Castillo.

These early architectural manifestations at Plaza A-III are relatively poorly defined, but the form of the Late Classic buildings is better understood. As documented by XAP, TDP, and other projects, the architectural core of Xunantunich expanded rapidly in size and volume over the course of approximately 150 years. This process began in the early Late Classic Samal phase (AD 600–670), and continued even more dramatically during the following Hats' Chaak phase. Lisa LeCount and Jason Yaeger (2010a) argue that this rapid

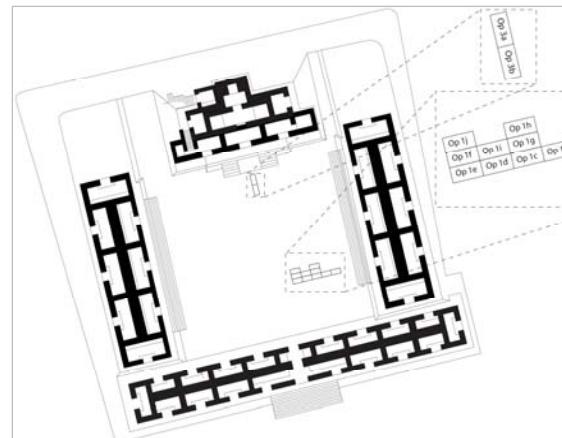


Figure 3. Hypothetical plan of Plaza A-III showing MVPP 2008 excavations. Drawing by Leah McCurdy.

expansion is directly related to Naranjo's expansion in the late 7th and early 8th centuries, which ultimately resulted in the imposition of Naranjo's authority over Xunantunich during the early part of the Hats' Chaak phase.

The modern architectural presentation of Plaza A-III is almost entirely the product of construction projects carried out during the Hats' Chaak phase, most of them within the first part of that phase. Thus, the plaza's form developed quickly. The first construction program entailed placing several meters of fill above earlier remains to create the large basal platform on which Structures A-10 through A-12 all sit. The earliest plastered surface atop this platform corresponds with the initial construction episodes of Structures A-10, A-11, and A-12. Thus, the plaza and its associated structures were conceived as a single unit, built in the Hats' Chaak phase to accommodate the Xunantunich ruler and the site's ruling court (Yaeger 2003). Richard Leventhal (2010) has argued that the ruler's court during the earlier Samal phase occupied a series of patios and vaulted structures on an 8-meter high acropolis, much of which was buried by later Hats' Chaak buildings and platforms to form the Castillo. Yaeger (2003, 2010; LeCount and Yaeger 2010a) and Leventhal (2010) have argued that the radical shift in the location of the ruling court was significant, marking a shift in political organization as well. The

new palace's location at the far north of the site fits a site plan template that Wendy Ashmore has associated with Naranjo and Calakmul (Ashmore and Sabloff 2002).

The initial constructions of Structures A-10, A-12, and perhaps A-13, were smaller than their final configurations, although their exact dimensions and layout remain unknown because they were razed to make way for later, somewhat expanded superstructures. The footprint of Structure A-11 remained relatively unchanged over the course of Hats' Chaak phase, although it did experience many modifications over its history.

Yaeger (2010) and others (e.g., Mackie 1985) have argued that the Upper Building of Structure A-11 served as the ruler's residence, given its layout of interconnected rooms, several low benches, inaccessible location, and the presence of an *in situ* use-related assemblage restricted to serving vessels and liquid storage jars. Structure A-11's Lower Building seems designed to create spaces for the ruler to interact with subjects and people in the plaza. Graffiti and patolli boards suggest divination and vision quests; an *in situ* assemblage of large storage vessels suggests the accumulation of tribute and/or storage of goods for use in courtly events (Yaeger 2003, 2010).

The functions of Structures A-10 and A-12 are harder to interpret, in part because of the lack of any *in situ* artifact assemblages. Their simple form—both consist of galleries of single rooms with tall benches, lacking any interconnecting doorways—suggests they were not residences. Perhaps they were used for storage of tribute, housing of visiting dignitaries, conducting meetings, and other miscellaneous functions (Yaeger 2010).

Structure A-13 is an *audiencia* structure. A series of rooms with tall benches, one with a patolli board, would have provided ample spaces for the ruler and members of the ruling court to interact with subjects (Yaeger 2003, 2010). Its single, large central corridor is the main route of access between the more public Plaza A-II and the more restricted Plaza A-III.

Finally, XAP investigations identified a service complex appended onto the eastern edge of the Plaza A-III basal platform (Jamison and Wolff 1994; LeCount 1995). Its four structures were organized around two patios, one large and one small. These small platforms most likely held pole and thatch buildings. A ceramic assemblage dominated by large storage and cooking vessels led Lisa LeCount (1995) to argue that this was a service complex where meals were prepared for the ruling family and for public feasts. A small side stairway leads up to Plaza A-III.

The palace complex was engineered to create a clear hierarchy of spaces of increasingly restricted access (Yaeger 2010). In its second phase of construction, the first tier is comprised of the northern rooms of Structure A-13, which open onto the building's substructure and face Plaza A-II. These rooms most likely served administrative functions and were the portion of palace most accessible to the polity's inhabitants (Yaeger 2010). From this space, the central corridor of Structure A-13 would lead the visitor into the plaza itself. At the southern end of the corridor, double-wide rooms with long benches would have served as waiting areas for guests, while small rooms on the northern end may have served as guard rooms. This configuration indicates that access into Plaza A-III was closely monitored and controlled (Yaeger 2010). Those who passed through the corridor would have had access to Structure A-13's southern gallery of rooms, which comprises the second level of access.

A third level of access could then be reached by descending the stairs from Structure A-13 down into the plaza's surface. The rooms of the three other structures surrounding the plaza constitute yet a fourth level of access, reached by surmounting the tall, broad stairways that led up to their elevated substructures. Of particular interest to us are the frontal terrace of Structure A-11 and the associated rooms of Structure A-11's Lower Building. A large masonry block originally divided the Structure A-11 stairway into two smaller

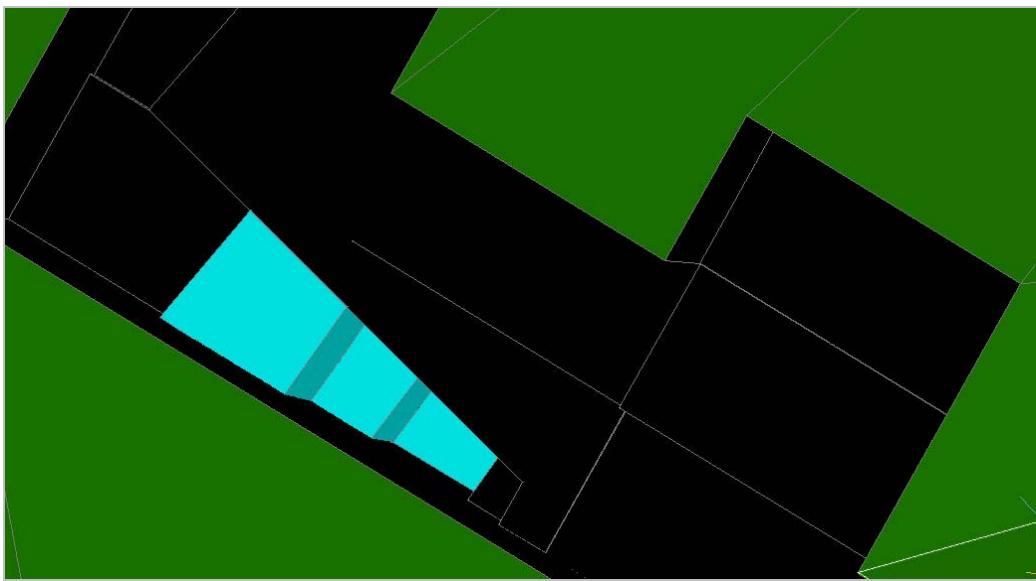


Figure 4. CAD model of Middle Preclassic modified bedrock steps uncovered during 2008 MVPP excavations. Illustration by Leah McCurdy.

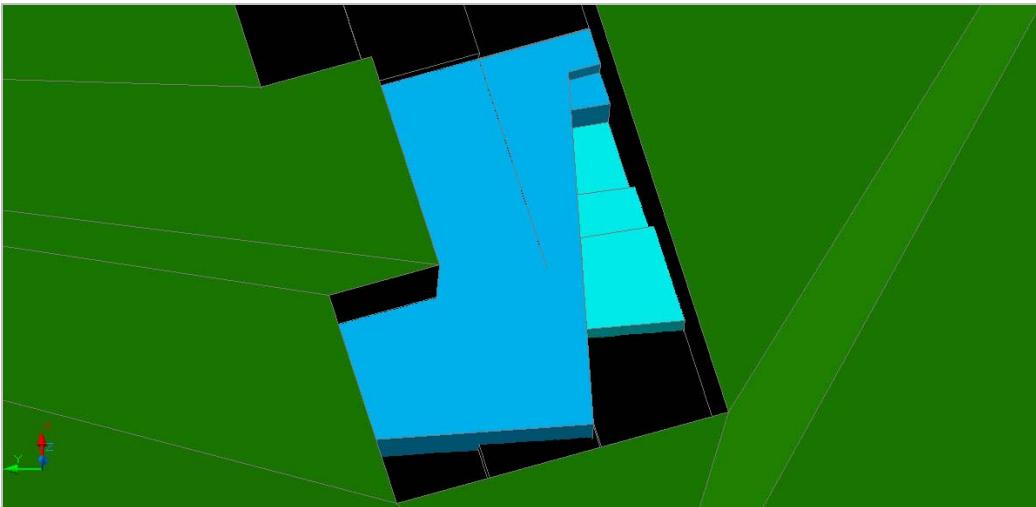


Figure 5. CAD model of the Early Classic platform and Middle Preclassic modified bedrock steps uncovered during 2008 MVPP excavations. Illustration by Leah McCurdy.

sections, while simultaneously providing a kind of stage that allowed activities occurring on the frontal terrace to be brought closer to participants and observers in the plaza (Yaeger 2010). The Lower Building was graced by a complex, modeled stucco façade with witz masks and other icons (Christophe Helmke, personal communication, 2010) that evoked the façade of the Castillo. Furthermore, a round sculpted panel ringed with hieroglyphs originally decorated the building's façade.

The latter contained a parentage statement that presumably linked the ruler to his father, although we lack critical fragments of the text (Helmke et al. 2010). This monument and the sculpted façade constituted important political statements that presumably grounded the ruler's authority in Maya cosmology and noble genealogy (Yaeger 2010).

Turning to the rooms themselves, curtain rod holders in the door jambs of the lower rooms indicate that at least some of

the activities in these rooms were meant to be private affairs. Graffiti, patolli boards, traces of red paint, and a ceramic drum fragment suggest that central room, at least sometimes, served ritual functions. The eastern rooms contained large storage jars, possibly for goods used in events in the plaza.

The western doorway of the Lower Building provided access to a hidden interior stairway, whose steep treads were the only way of gaining access to the sixth and final zone of space in the palace. This stairway is quite clever in its composition, as it was constructed in such a way that the individual ascending would seem to suddenly appear on the roof the Lower Building after entering its western doorway. The means of accessing the upper level was hidden from the plaza view and could easily be guarded and controlled.

These increasing levels of access provide insight into the use of the Plaza in the early Hats' Chaak phase. The layout served the mundane but important purpose of restricting access to the ruler's residence and providing him and his immediate family with some degree of privacy and security. Thinking in ideological terms, however, the layout also served to restrict access to the physical and spiritual person of the ruler himself (also McAnany 2008). Access to the ruler was likely an important prerogative to his vassals. In that respect, it is interesting to note that the broad stairways and narrow doorways that served as points of access to the various levels of space that we have identified in the palace would have made passage from one level of space to the next very visible. Yaeger (2010) has argued that the prerogative to move deeper and deeper into the palace complex and up the corresponding spatial hierarchy served as an important index of social positioning and a means of reconfiguring the socio-political architecture of the polity in the wake of the imposition of Naranjo's sovereignty in the Hats' Chaak phase.

The subsequent modifications to the architecture of Plaza A-III further provide insight into the political changes at

Xunantunich. The first modifications to Structure A-11 suggest an increasing retreat of the ruler from his subjects, a phenomenon identified by Thomas Jamison (2010) and Leventhal (2010) in other facets of the site's layout. Structure A-11's interior stair was entirely blocked and a new, rear stair was added. This required the addition of a small room in the Upper Building, which could have accommodated an individual meant to control access to the ruler's residence.

At the same time, the masonry block associated with the frontal terrace was removed, the floor of the frontal terrace was raised 30 centimeters, and a new wider stairway was placed over the remains of the dismantled masonry block. These alterations not only changed the appearance of Structure A-11's main façade but they altered the long established access route to the Lower Building and further retracted the activities associated with the ruler from the broader public.

Concurrent with the modifications to Structure A-11, there was a major resurfacing of Plaza A-III, which raised the level of the plaza about 20 centimeters. Several investigators (Harrison 1997; Jamison and Wolff 1995; Yaeger 1998) connect this resurfacing with the installment of a plaza drain and the construction of "platform plugs" that closed off the southeast and southwest corners of the plaza by connecting the substructures of Structures A-10, A-12 and A-13. These plugs served to restrict outside access to the plaza even further by closing viewsheds into the plaza. Subsequently, Structure A-11 was partially dismantled and ritually terminated (Yaeger 2010). The vaults were torn down along with the upper portions of the interior walls, in some cases to the level of the floor. The rooms were filled in with clean white marl, which was topped by an offering with a non-local ceramic vessel. A lone male individual was placed in the white marl layer. The context of this burial, coupled with the individual's unusual body position, lack of grave goods, and absence of burial architecture, all suggest this was a sacrifice. Yaeger (2010) has argued elsewhere that

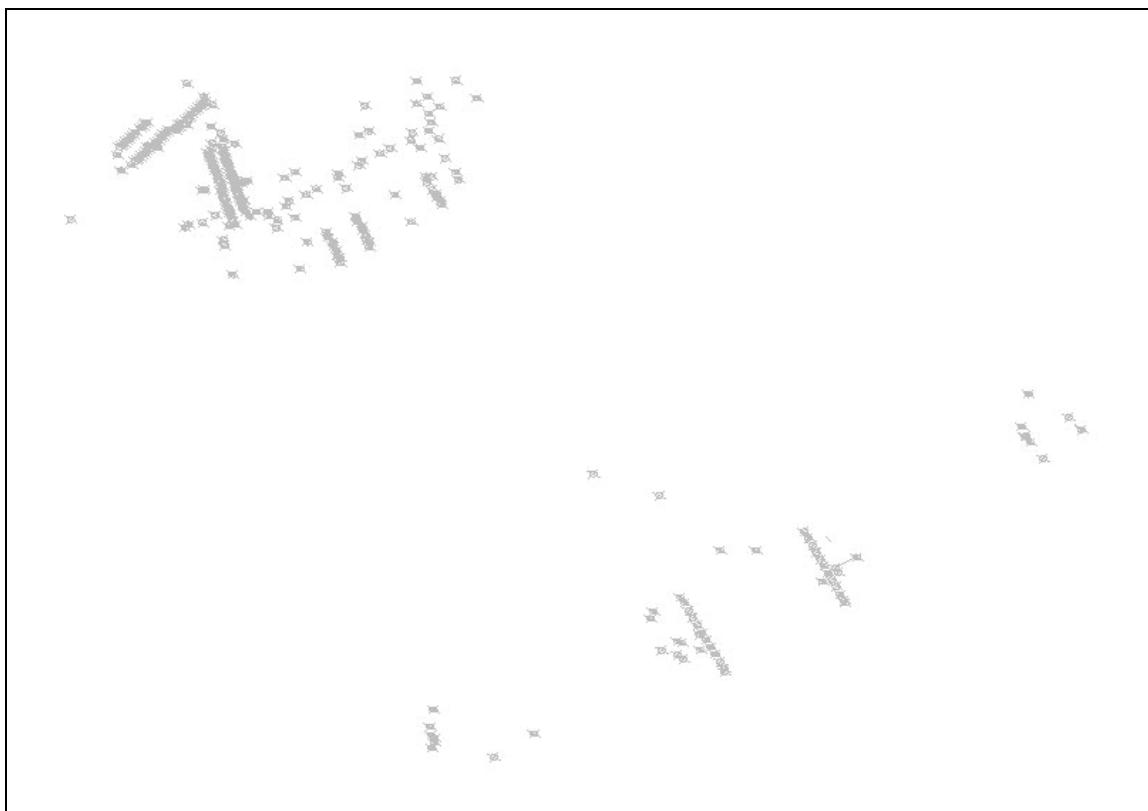


Figure 6. CAD snapshot of 3D coordinates in Plaza A-III captured using a total station. Illustration by Leah McCurdy.

these lines of evidence indicate a descretatory termination following the conquest of the site. This event probably occurred around AD 750–775; if so, the occupation of Plaza A-III in its Late Classic form lasted less than a century.

The Virtual Reality of Plaza A-III

In order to better understand and visually present the architectural development of Plaza A-III, Leah McCurdy (2010) applied several new approaches in computerized architectural recreation and visualization to the plaza's buildings. When using virtual reality (VR) creation for the visualization of archaeological remains, one begins by building up a reconstruction in multiple layers. This “re-construction” can ultimately provide an audience with something approaching an actual “virtual reality” experience.

The most basic and most important layer of a virtual reality is the raw archaeological data. Figure 6 shows the set of total station

coordinates captured from Plaza A-III. These points are the closest representation of the actual archaeological reality as documented through fieldwork. The subsequent layers of virtual realities build upon this foundation, and thus it should be as accurate and detailed as possible. These subsequent levels of reconstruction necessarily entail greater and greater subjectivity as well (Eiteljorg 2000). Many archaeologists working with architecture use computer-aided design (CAD) software, as its capabilities for producing three-dimensional geometric forms provide an excellent platform for producing virtual reconstructions (Barcelo 2000; Fernie and Richards 2003; Miller and Richards 1995; Niccolucci 2002). CAD software provides a tool for rendering the architectural features documented through archaeological fieldwork as a series of 3D forms in virtual space. This rendering in turn can form the basis for cautious and reasoned extrapolation, through which one can

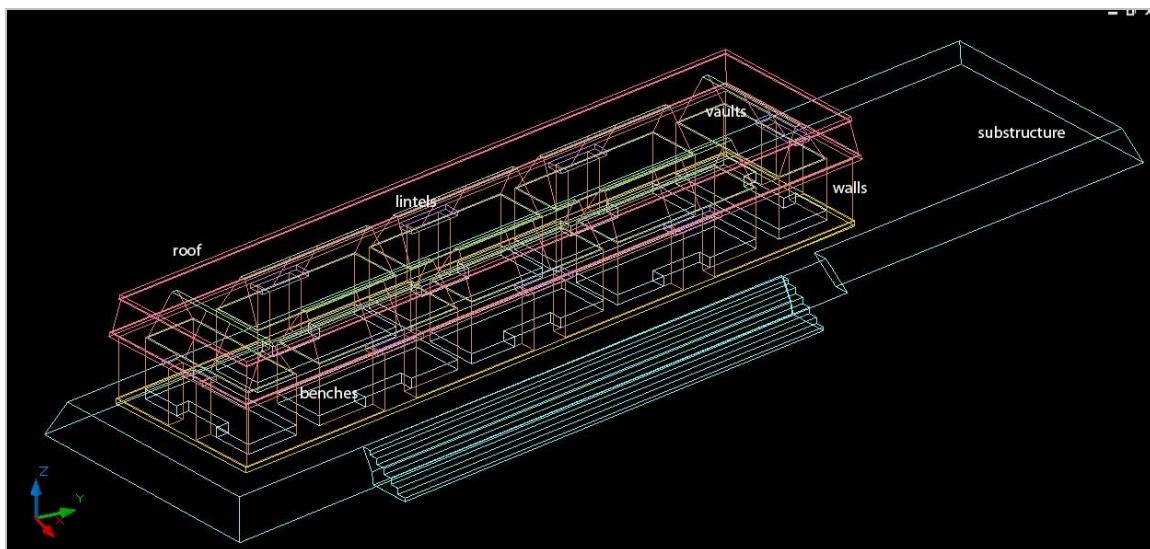


Figure 7. CAD model of Structure A-12 with labels of various architectural features. Illustration by Leah McCurdy.

reconstruct a hypothetical the building's hypothetical form, essentially a model of the original building (Figure 7). Utilizing CAD can thus lead to reconstructions and models that are visually much easier to understand, presenting to the audience a potentially fuller understanding of the archaeological material and the interpretations we build on that material.

Visualization, an example of which is seen in Figure 8, adds another layer of “reality” to a reconstructed model. The use of visualization software, such as Blender, allows a user to project relatively accurate material, lighting, and environmental information onto the reconstructed geometry of the building and associated spaces (see www.blender.org for more information). Admittedly, these layers represent a far more conjectural virtual reality than the total station data and the geometric forms constructed from those points (Eiteljorg 2000). While CAD geometry is based on systematically captured data—in our case, total station survey coordinates—visualization requires choosing among predetermined options and parameter settings. Much of the work produced in visualization packages is oriented toward aesthetics, as opposed to accuracy. Thus, while the CAD reconstruction is closely

defined and constrained by archaeological data—points, lines and solid forms—the choices made in modifying that reconstruction in Blender are aesthetically driven, as one seeks to convey a sense of atmosphere or environmental specificity. More subjective decision-making pervades this aspect of the virtual reconstruction process, as each layer of modeling involves additional subjectivity (Baker 2007; Eiteljorg 2000; London Charter Initiative 2006; Murgatroyd 2008).

A further step in a virtual reality recreation is animation. Creating this layer involves the manipulation of the graphic material by adding the dimension of time, thus creating movement through space over time. Animations are choreographed to convey a particular set of experiences with a discrete amount of drama. Animating virtual reconstructions brings a multitude of challenges for the animator and a series of expectations on the part of the viewer. Producers of television shows, films, and video games draw on archaeologically based material—often very loosely based!—in their animations for a variety of intents and purposes. As a result, viewers of VR bring particular expectations established by consuming those media to every application of virtual reality, such as those used in

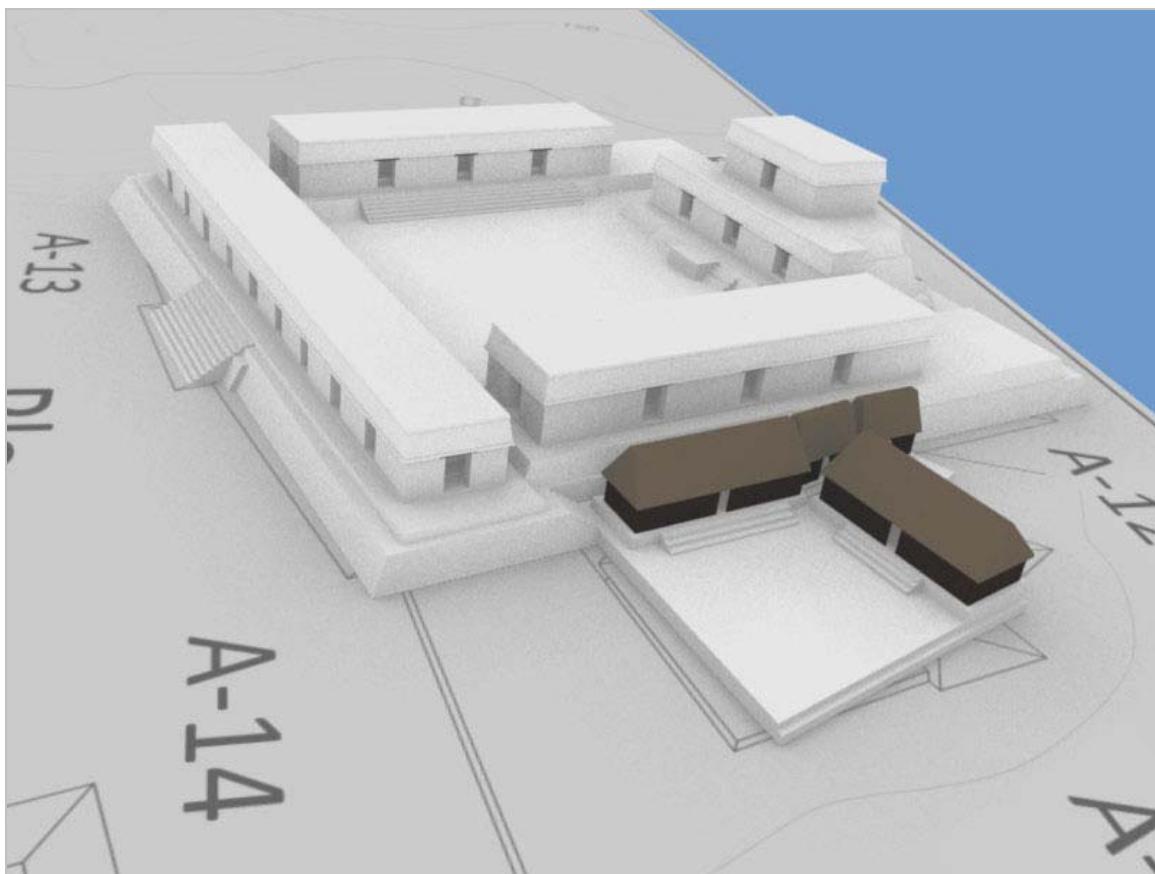


Figure 8. Visualization of Xunantunich Plaza A-III using Blender software. Illustration by Leah McCurdy.

museums and in educational venues. Most of these expectations are unrealistic. Reconstructions created for television, for example, are very rarely rigorous and show little concern for staying true to the archaeological foundations of their reconstructions.

Recently, individuals creating virtual realities of archaeological sites have discovered the potential of game engines to provide another layer to a VR resource (Anderson 2004; Anderson 2008; Anderson *et al* 2009; Meister and Boss 2004). *Lara Croft Tomb Raider* and the various *Indiana Jones* video games are commercialized products that hold no bearing on actual archaeological “games” as tools. The term game engine refers to a piece of software, such as Unity (refer to www.unity3d.com for more information), that is used to build video game landscapes and scenarios. Game engines import data and reconstructions

directly from visualization programs like Blender and then allow the user to interact in real time with the reconstruction as a visualized being in virtual space.

While a game engine interface strongly enhances the interactivity of a virtual reality resource for a viewing public, it also holds potential to be a valuable interpretive and analytic tool. For example, McCurdy intends to use the application of game engine technology in archaeology to advance phenomenological analyses of ancient space and place. The experiential value one can gain from being inside a virtual reconstruction is an important asset for an archaeologist who is trying to present interpretations to fellow academics as well as the general public.

Returning to Xunantunich, McCurdy’s application of the layers of VR to Plaza A-III now can accomplish several goals. First, the data can be visually represented as both

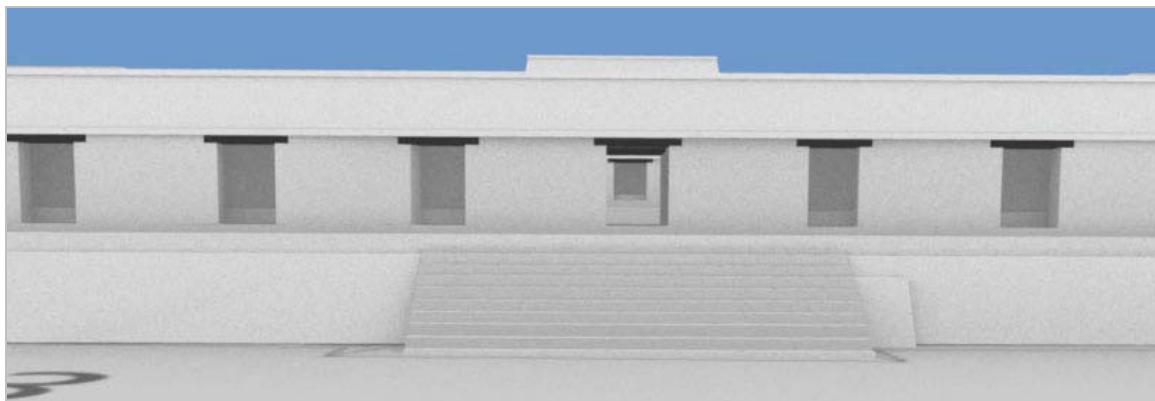


Figure 9. Virtual reality viewshed from Xunantunich Plaza A-II through Structure A-13 and into Plaza A-III. Illustration by Leah McCurdy.

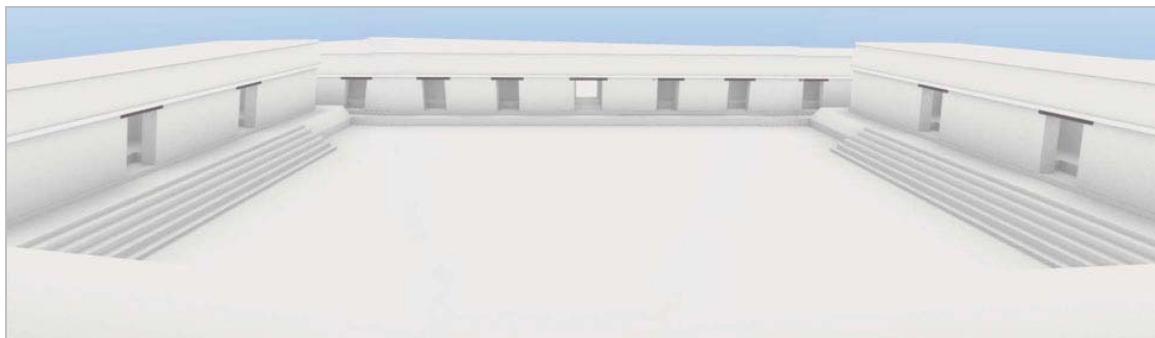


Figure 10. Virtual reality viewshed from Xunantunich Structure A-11's Upper Building down into Plaza A-III. Illustration by Leah McCurdy.

still images and animated reconstructions for a range of audiences. These kinds of representations can allow archaeologists to be more effective in our mission of disseminating our results to a wider audience. Particularly given the current conventions against physical reconstruction of structures, VR provides a way for a visitor to a site—whether he or she is physically present or just visiting virtually—to experience an archaeologically accurate model of how the site's buildings once appeared. Thus, critical archaeological interpretation is as available as intuitively consumable mass media interpretations.

Second, we can use the resulting virtual resource to address a range of research questions. Currently, McCurdy is using the 3D reconstructed CAD model and game-engine walkthroughs to examine how the changing architectural configurations of the palace altered viewsheds within and into the

space (Figures 9 and 10). She will examine whether people in Plaza A-II could see into Plaza A-III, and determine the viewsheds that connected Plaza A-III to the ritually charged rooms of the Lower Building and to the ruler's private quarters in the Upper Building. The answers that result will, in turn, feed into broader questions of the changing nature of rulership at Xunantunich. As importantly, this VR resource can not only provide insights into these questions we are currently asking, but it also has the potential to address myriad future questions, as yet unformulated.

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19 DIVING THE SACRED POOLS OF CARA BLANCA, BELIZE

Lisa J. Lucero, Patricia A. Beddows and Andrew Kinkella

The goal of the three week 2010 Valley of Peace Archaeology diving expedition was to ascertain if southern Maya lowland water bodies, like caves, served as portals to the underworld, into which the Maya left offerings. We dove eight of the 25 freshwater pools in the Cara Blanca area to look for offerings. With the abundant and perennial water sources, one would expect to find this area to be densely settled; instead, it may have been a sacred place to the Maya, evidenced by the lack of significant settlement and the concentration of natural sacred landscape features. The expedition began with exploration, mapping and physical-chemical profiling. Pool 1 proved particularly unique due to the discovery of an underwater cave, large crystals veins and mega-fauna fossils, its depth exceeding 60m. Preliminary indications are that the Cara Blanca pools served as a sacred place that increased in importance at the end of the Late Classic period amidst an enduring drought.

Introduction

The major goal of the Valley of Peace Archeology (VOPA) 2010 (April 26-May 14) diving expedition in central Belize was to ascertain if the Cara Blanca *cenotes* served as portals to the underworld or Xibalba, into which the ancient Maya left offerings similar to those found in caves such as Actun Tunichil Muknal, and northern lowland *cenotes* (e.g., Chichén Itzá) (Andrews and Corletta 1995; Bassie-Sweet 1996; Schele and Miller 1986:42). Cara Blanca ('white face') encompasses at least 25 pools along the base of an 80 to 100 m limestone escarpment (Figure 1). We have now visited twenty two of the pools, some of which have associated Maya buildings. The far western and eastern pools lie level with the ground surface, making these more pond or lake-like, while the central water bodies include exposed bedrock cliffs, a feature commonly associated with *cenotes*, or karstic sinkholes in the north and central Yucatán Peninsula (Beddows 2003). We dove eight of the twenty five pools. They are distinctive in that they are as deep as 60+ m, and some have associated buildings, likely ceremonial (Kinkella 2009; Lucero and Kinkella n.d.).

With the abundant water sources and nearby good agricultural land, one would expect to find dense settlement at Cara Blanca, especially given the annual 4-6 month dry season when water became critical. The lack of dense settlement may indicate that Cara Blanca served as a sacred

place to the ancient Maya because of its concentration of natural, sacred features in the form of mountains and openings in the earth. The supernatural world of the Maya included three layers, an upperworld or heaven with 13 levels, the earth, and the underworld with nine levels (Schele and Freidel 1990:67). Other sacred features include mountains, home to the ancestors who are reached through visiting and leaving offerings in portals. Unlike at centers such as Tikal, Caracol and others, the Maya did not have to build artificial counterparts at Cara Blanca in the form of temples that stood for mountains, temple doorways for caves, and reservoirs for pools (Fash 2005; Lucero 2006a, 2006b; Lucero and Kinkella n.d.; Scarborough 1998, 2003). Consequently, the Maya left this landscape relatively untouched. If we find offerings in the pools, they should be able to reveal the significance of this area, perhaps as a pilgrimage site. Throughout Mesoamerica, people made pilgrimages for the sake of water, patron, and other gods (e.g., Kubler 1985).

Pool 1 Explorations

Previous test excavations at several structures near Pool 1 yielded mostly jars that date to the end of the Late Classic period, or c. A.D. 800-900 (Kinkella 2000, 2004), an atypical ceramic assemblage that does not indicate a residential function per se. The Maya may have collected sacred water in jars for special ceremonies that took

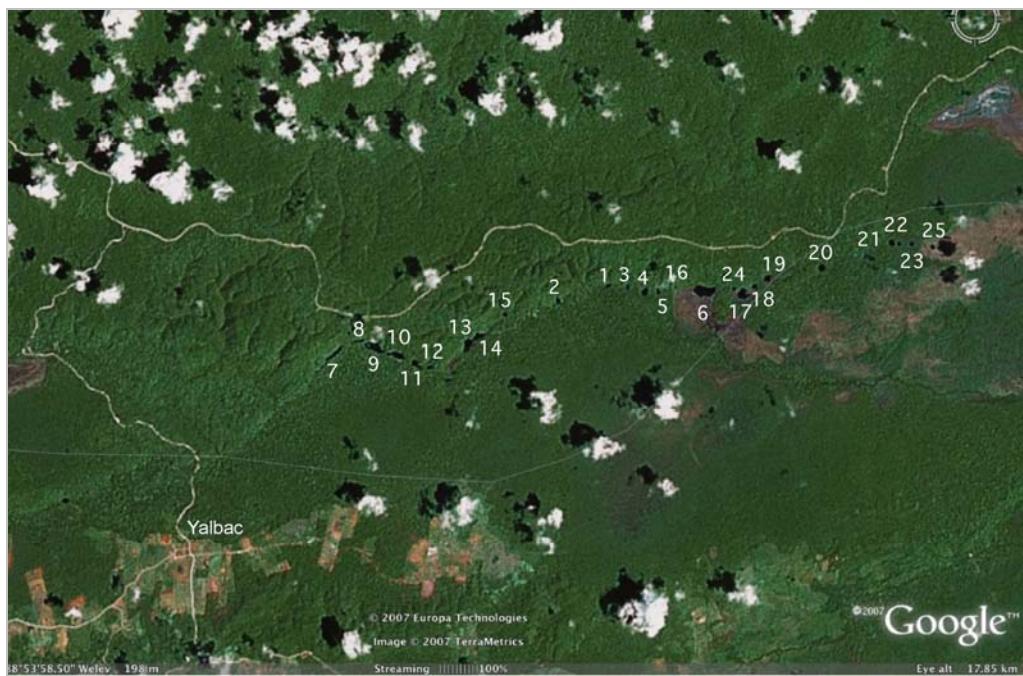


Figure 1. Google Map with Cara Blanca pools labeled.

place either at the pool(s) or in nearby centers in practices similar to those documented at Zinacantecos in Chiapas, Mexico, where shamans' assistants collect water from sacred waterholes for curing ceremonies (Vogt 1993:63-65; see Taube 2001). We also could be dealing with a situation similar to that suggested for several cave deposits—that is, evidence for a drought cult at the end of the Late Classic when Maya intensified ritual activities to supplicate the rain gods to end a long drought (Moyes et al. 2009).

The dive team included Patricia Beddows, a hydrologist and geochemist from Northwestern University; Andrew Kinkella (Moorpark College), an archaeologist with underwater experience; Edward Mallon, who provided topside logistics; Marty O'Farrell, underwater videographer (<http://www.seaofarrell.com/>); and cave dive instructors Robbie Schmittner (<http://www.xibalbadivecenter.com/>), Kim Davidsson, and Bil Phillips (<http://www.speleotech.com/index.html>).

Pool 1 is a steep-sided *cenote* (c. 100 x 60 m) surrounded by seven mounds (Figure 2). Looters' trenches show that the largest

structure (Str. 1, 22 x 15 m, 4 m tall) is quite complex in its architectural design, consisting of a vaulted range building with six rooms, three to a side, radiating out from a central spine wall and a series of three or four pillar-like walls that run the poolside length of the structure. Excessive debris build-up at the southeast corner of Str. 1 indicates that there may have been an additional room attached to the building. The structure sits so close to the pool's edge that part of its eastern wall has collapsed into the water. Kinkella (2009:176) posits that Str. 1 may have served as a sweatbath based on its similar configuration to one at Piedras Negras. There is also a larger group of mounds located c. 400 m west of Pool 1 (and c. 400 m east of Pool 2) consisting of 15 structures including several range structures and a circular sweatbath (Kinkella 2008) (Figure 3).

On the first day of diving at Pool 1, Schmittner and Davidsson discovered a large cave entrance beginning 30 m below surface that extended to 60 m, or the pool floor, that we named Actun Ek Nen (Black Mirror Cave). They, along with Phillips and O'Farrell, explored it further to reveal that

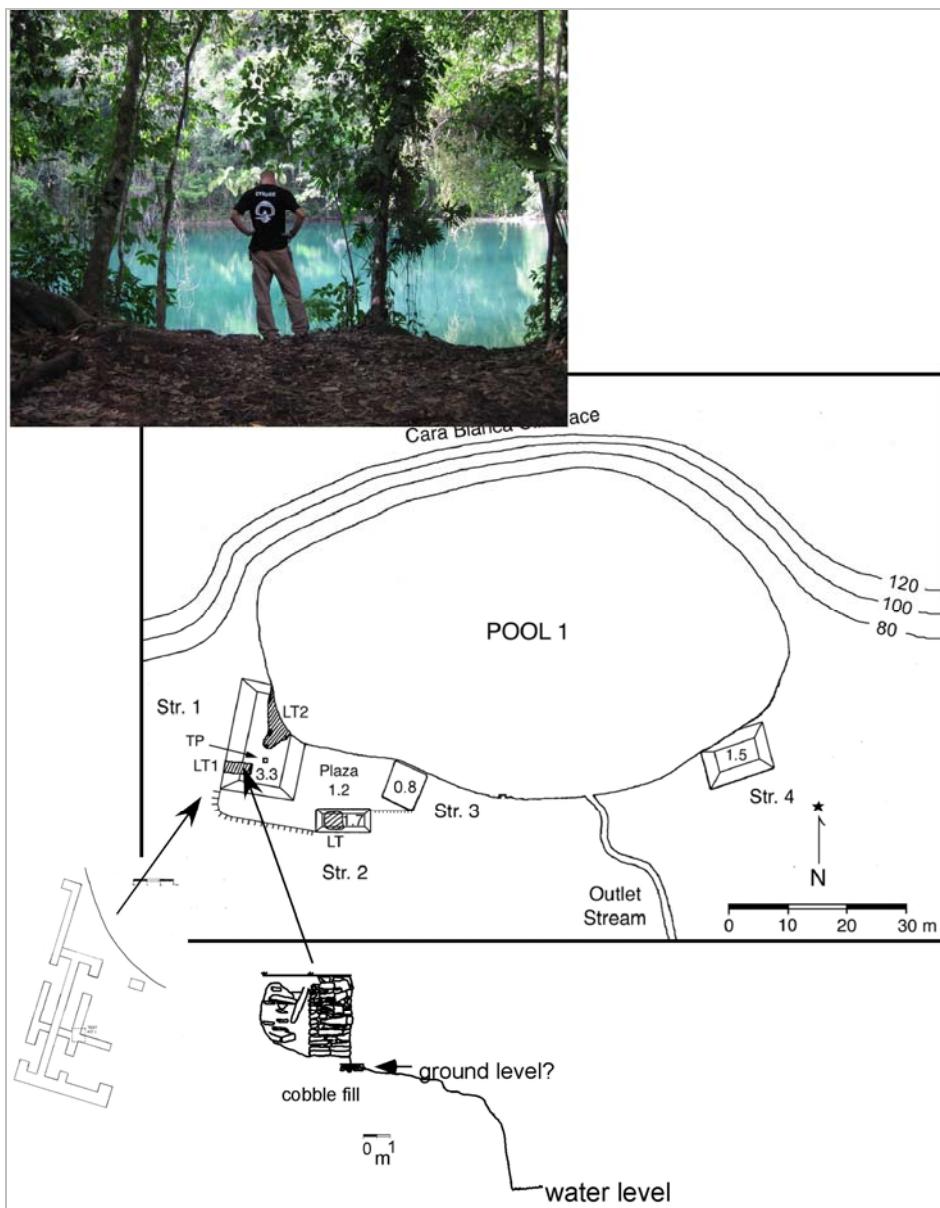


Figure 2. Pool 1 (line drawings by A. Kinkella).

the cave entrance is, at a depth of 40 m below the water table, at least 40 m wide and penetrates 80 m into the cave—which according the Belize Institute of Archaeology records makes it the largest freshwater cave on record in Belize.

The depth of the pool is impressive as well; according to a list of deepest caves in Quintana Roo, Mexico (<http://www.caves.org/project/qrss/qrdeep.htm>), Pool 1 would be the 4th or 5th deepest for the greater Caribbean region of the Yucatán

Peninsula. Belize is located south of Quintana Roo, Mexico, both of which lie within the geological Yucatán Peninsula. Divers mapped Pool 1 dimensions by attaching nylon line knotted every 10 feet to features around the perimeter at various depths creating nested perimeter lines at 5-6 m and 14-16 m depths. These mapped perimeter lines parallel natural ledges apparent at c. 7 and 20 m depth on the non-escarpment sides of the steep cenote. They also laid a line north-south bisecting the



Figure 3. Pools 1 and 2 settlement and sweatbath architecture (line drawings by A. Kinkella).



Figure 4. Kim Davidsson with humerus fossil; rib fragment on left; vertebra on right with humerus.

perimeter lines and the entire pool with a maximum depth of c. 40 m to map its bathymetry (underwater topography). The pool floor slopes from c. 35 m at the center, to the deepest identified point at c. 60 m below the overhanging cliff face. In other words, the pool bottom slopes down north towards the escarpment. This fact begs the question if the slope continues its downward trajectory once inside the cave.

Along the steep *cenote* walls in the northwest side and to the west of the sheer escarpment face, divers also discovered geological beds laden with fossilized megafauna bones including a tusk, humerus, pelvis, and vertebra, the first recorded fossilized bones in Belize. The fossil beds lie 20 m and 30 m below the water surface; Davidsson thinks that part of the 20 m deposit collapsed and that the 30 m deposit actually represents the 20 m collapsed bed. Divers collected three specimens; a rib and vertebra fragments from c. 30 m below surface on the south side of Pool 1, and an arm bone c. 20 m below surface on the west side (curated at the IA) (Figure 4). The fossils have tentatively been identified as giant sloths (*Eremotherium laurillardi*; McDonald 2011). Divers also noted large veins with infilling gypsum crystals that begin at c. 13.5 m below the surface and extend to 50 m.

Kinkella and Mallon also recovered a Cayo Unslipped jar rim immediately beneath the water surface at the pool's edge near Str. 4 (15 x 11 m, 1.65 m tall) dating to c. A.D. 800-900 (Figure 5). They also recovered a grey-banded and cracked chert disc, which may have been fire-cracked, c. 10 m below surface near Str. 1 that was lodged in the sidewall. Mallon also found a polychrome sherd that he collected at water level near Str. 1 that was subsequently lost. Mallon snorkeled the area immediately below the surface between Strs. 1 and 4 and noted the presence of several sherds (not collected), including a polychrome one with black and orange designs near Str. 4 c. 15 cm from the jar rim near St. 4. We also

explored several other *cenotes*: Pools 2, 3, 4, 5, 6, 16, and 20 which are quite diverse.

Pools 2, 3, 4, 5, 6, 16, and 20

The other pools divers explored, Pools 2, 3, 4, 5, 6, 16, and 20, range in depth from 5 to 18 m. Some pools have lots of fish, others few; some have specific areas with dense plant life, whereas the majority of shallow areas of some pools are devoid of submerged vegetation; some have hundreds of burrows (likely eel), whereas others are covered with debris (e.g., leaves and trees). Divers noted that some of the sunken trees found in all pools are quite massive. The crocodiles seen at most pools ignored the divers. There are also turtles, catfish, eels and crabs, but few or no mollusks. Outcrops of gypsum crystal were noted in some of the pool walls (e.g., Pools 1, 16), which became larger the deeper one went. Every pool has subaqueous outflows and inflows, indicating that they are hydrogeologically connected through an underground network of fractures and/or caves.

Of the eight pools explored, only Pools 1 and 20 had associated Maya settlement. Kinkella mapped a large platform (c. 35 x 30 m) c. 25 m north of the pool with three structures, one c. 2.3 m tall, that faces south towards the pool. On the last day of diving at Pool 20, divers found more fossil beds 5-8 m below surface on the north side—likely the same as those in Pool 1. This pool is relatively deep (over 35 m), though divers were unable to reach bottom due to time constraints. Further, this *cenote* lies a little beyond the eastern escarpment and, in contrast to Pool 1, does not sit at the base of a cliff.

Divers also manually extracted two sediment cores (4" diameter) of c. 3 m penetration from depths of c. 4 m in Pool 2, and c. 14 m from Pool 6. The cores were split, examined, photo documented, and sectioned in 1 to 2.5 cm thick disks at the base camp. Geochemical analysis of the sediment will provide information to reconstruct the past ecology, hydrology and climate, which should be

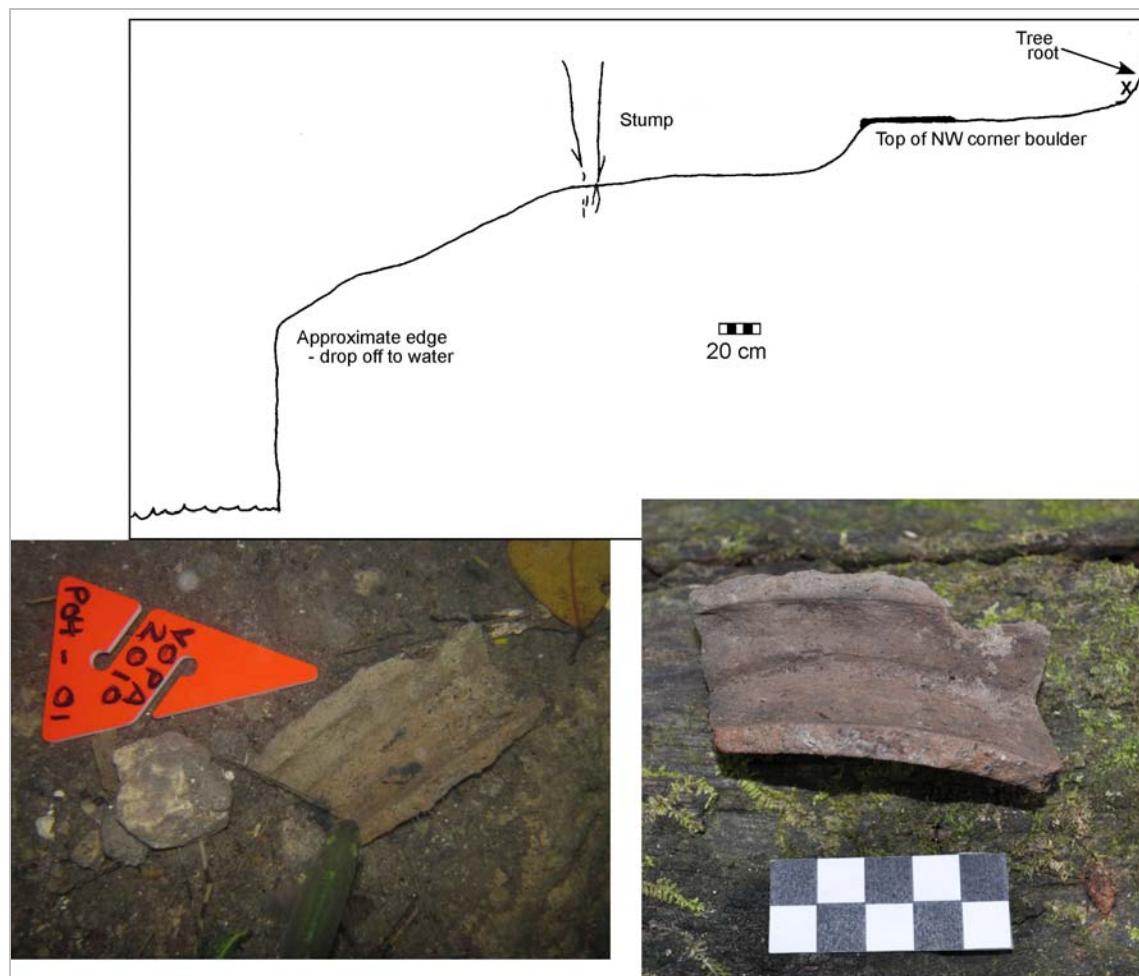


Figure 5. West profile of Str. 4, Pool 1, and jar rim.

illuminating in view of our ideas about the drought and how it impacted the lowland Maya (e.g., Lucero 2002). Patricia Beddows is currently conducting sediment analysis, while University of Illinois at Urbana-Champaign (UIUC) Ph.D. student Colleen Lindsay has started working with plant biologist Surangi Punyasenain at UIUC on the pollen analysis. We are also sending out carbon samples for AMS dating.

Beddows chemically profiled each of the water pools using a multi-parameter Hydrolab. All of the pools contain elevated dissolved solids (1.5 – 1.7 g/L TDS; 2.5 – 2.7 mS/cm electrical conductivity), making them technically brackish water, and thus of questionable potability. Several observations point to specifically elevated sulphur levels: floating white particulate

(bacterial?) matter, dense deep layers of noxious hydrogen sulphide, and the surprising existence of the highly soluble gypsum (CaSO_4) crystals. Pool 1 appears to have the freshest water to date. That said, in most cases, drinking water over the long term could have resulted in metabolic problems such as increased kidney stress, and potentially the formation of kidney stones from the high total dissolved solids. The low oxygen in the pool bottom waters (ranging 0.2 – 1.5 mg/L DO), however, is quite good for preserving organic materials, including those found in the sediment cores. Eels, which were found in the two pools from which we extracted the cores, unfortunately are partial to low oxygen and can noticeably burrow down into, and bioturbate the sediment horizon.

Concluding Remarks

It is interesting that we find ancient Maya settlement beside the deeper pools. Did the ancient Maya know they were so deep? Why did they build specialized structures nears these pools more so than at other Cara Blanca pools? Future explorations should address these questions. As mentioned, there is increasing evidence that the Maya intensified ritual activities in sacred places at the end of the Late Classic period amidst an extended drought. This could have been the case at Cara Blanca since the vast majority of ceramics recovered date to the end of the Late Classic period. Further, most of the ceramics consist of water jars. We will also need to further assess the water quality issue. The presence of water jars indicates that the Maya collected water, likely for ritual and practical uses.

The concentration of so many pools in one area and the relatively small-scale and unique settlement indicate that Cara Blanca likely served as a sacred place to the ancient Maya, likely as a pilgrimage center. Similarities to pilgrimage sites elsewhere (e.g., Cenote of Sacrifice at Chichén Itzá) and other types of evidence, such as the predominance of jars, indicate such a place. In fact, the Maya may have collected sacred or virgin water in jars for special ceremonies that took place either at the Cara Blanca pools or in nearby centers, similar to the Zinacanteco case mentioned earlier. A comparison of Cara Blanca jars and artifacts with collections from the centers of Yalbac (c. 7 km distant), San Jose (c. 11 km distant), Saturday Creek (c. 11 km distant) and others, should reveal if people from different areas deposited offerings in pools and collected sacred water, a plan in the works as part of future investigations.

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20 INVESTIGATING AN ANCIENT MAYA MARKETPLACE AT BUENA VISTA DEL CAYO, BELIZE

Bernadette Cap

Early colonial accounts relate that marketplaces were used in the Maya lowlands at the time of Spanish contact. Some scholars argue that Maya marketplaces were products of a Postclassic mercantilized economy. Others have argued that marketplaces were integral to Maya economic systems during the Classic period (AD 600-900). Scholars have begun to address how to empirically identify ancient Maya marketplaces. The research presented here contributes to this growing body of inquiry through an in-depth investigation of the East Plaza at the Classic period site of Buenavista del Cayo, Belize. Because identifying marketplaces archaeologically has proven to be difficult, I have taken a comprehensive approach, using a combination of methodologies and a suite of empirically testable correlates, to infer the activities that took place in the East Plaza. My research indicates that in the Late Classic, the East Plaza was host to a marketplace where obsidian blades, chert bifaces, and probably food were sold.

Introduction

Early colonial authors relate that marketplaces were used in the Maya lowlands at the time of Spanish contact (Landa [Tozzer 1941]; Oveido y Valdes 1851), but some scholars argue that these marketplaces were products of a Postclassic Maya mercantilized economy. Others have argued that marketplaces were integral to Maya economic systems during the Classic period (AD 600-900). This latter position begs several questions. Why would the Classic Maya create marketplaces? What would a Classic period marketplace look like archaeologically? In this paper I address these questions using data collected at the Classic period center of Buenavista del Cayo, Belize.

Why are Marketplaces Important?

Determining whether marketplaces played a role in Classic Maya economies is important because, where they do exist they serve as important nodes for economic, social, and political interactions. Marketplaces often form in areas where reliance on other types of exchange, such as tribute collection, redistribution, reciprocity, or purchase from itinerant merchants, does not fulfill all of a household's provisioning needs. These types of exchange typically take place in conjunction with marketplaces. However, marketplaces offer additional benefits that other types of exchange do not. Unlike tribute, gifting, and redistribution,

which are often strongly shaped by political and social relationships, marketplaces are locales where individuals from all sectors of society have equal access to the same goods. For the consumer, shopping at a marketplace can decrease the amount of time spent in obtaining goods. Additionally, the ability to compare price and quality of goods, which is made possible by placing vendors in close proximity, allows consumers to make more informed decisions about their purchases. For the vendor, creating a single point of sale is beneficial because it can decrease travel costs and potentially provide a larger client base than would be attainable otherwise. Overall, marketplaces are important economic entities because they provide a regularized, predictable, and regulated system of exchange (Plattner 1989).

In addition to their economic functions, marketplaces also serve as central points of social, political, and religious interactions and communication (Bohannan and Dalton 1962). Besides economic activities, many other activities, such as resolving legal disputes, proselytizing, and theatrical performances, take place in association with marketplaces. Relationships are formed and maintained through these different types of interactions in a marketplace. Additionally, the gathering of a significant portion of the population at the same time, in one place, provides an easily accessible audience for leaders of society to convey information and

perform activities that could help legitimize their authority.

The Maya Marketplace Debate

The existence of marketplaces in the Classic period has been debated strongly by Maya scholars. A major reason for this debate can be attributed to differing perceptions of household economies (McAnany 1992). Households have long been considered the basic production unit of society but how self-sufficient were they? One view holds that households were largely self-reliant in that they were able access locally available raw materials and produce most of the goods they needed independent of each other and elite control (Potter and King 1995; Rice 1987; Sanders 1989). Trade with kin and itinerant traders, together with gifting, allowed them to meet shortfalls and obtain non-locally available goods and items they were unable to make themselves. In this view, marketplaces are not needed. An alternative perspective of household economies suggests households relied heavily on inter- and intraregional exchange to fulfill their needs and wants (e.g., Freidel 1981; McAnany 2010; Pyburn 2008). In this view of household economies, centralized marketplaces would have been an efficient way to bring together sellers and consumers.

Clearly these two perspectives represent very different views of Maya economic organization, with equally different expectations regarding Classic period marketplaces. While data from recent household studies have been used to infer that households provisioned themselves at least in part through marketplaces (e.g., Chase and Chase 2004; Halperin et al. 2009), questions remain about the identification of marketplaces themselves in the archaeological record.

In general, the Classic Maya corpus provides only a limited perspective of economic interactions which emphasizes the elite sector of society. An exception may be the murals discovered in the Chiik Nahb complex at Calakmul, Mexico. The mural scenes depict individuals who are giving,

receiving, or carrying a variety of goods, some of which are named in accompanying texts. Initial interpretations of the murals suggested the scenes portray marketplace activities (Martin 2007), but they have also been interpreted as showing feasting (Boucher and Quinones 2007). Thus, the Calakmul murals remain an exciting, but unconfirmed, possible line of evidence for Late Classic Maya marketplaces.

Early archaeological arguments for Classic period marketplaces were largely based on inferences drawn from analysis of site plans and the presence of features such as large, easily accessible plazas in site cores with or without stall-like structures (e.g., Chase and Chase 2004; Jones 1996; Sabloff and Tourtellot 1992). In the modern and historic periods, marketplaces are often found in centrally located, open spaces with entrances that are free of social or physical obstructions. The physical space in which a marketplace is held is an important feature to consider, but recognizing a space as a marketplace based just on this characteristic alone does not make for a convincing interpretation.

Marketplaces have also been inferred through the distributional approach advocated by Kenneth Hirth (1998), where the homogeneity in the distribution of particular artifact classes amongst consumer households has been used to suggest Classic Maya households were provisioned largely through market exchange principles (e.g., Chase and Chase 2004; Halperin et al. 2009). However, because these studies infer marketplaces from consumption, and not exchange, they do not identify the physical location of marketplaces. This is very important, because economic systems based on market principles do not necessarily require physical, centralized marketplaces.

Recently, researchers at several Maya sites have sought to identify the physical location and features of marketplaces (e.g., Dahlin and Ardren 2002; Keller 2006; Wurtzburg 1991). Empirical evidence of marketplaces used in these studies are large, centrally located plaza spaces that contain low platforms that are posited to be vendor

stalls (Dahlin 2003; Wurtzburg 1991), end-stage lithic production debris suggestive of knappers finishing tools while waiting for customers (Keller 2006), and/or linear patterns in soil phosphorous patterns that indicate selling areas and their spatial distribution (Dahlin et al. 2007; Terry et al. 2010). Research such as this has created a foundation of data on which to build empirical interpretations.

Based on these studies, scholars are starting to discuss the significance of marketplaces in Classic Maya society (e.g., McAnany 2010; Rice 2009). However, marketplaces often leave weak archaeological signatures and some of their archaeological correlates can be ambiguous if used individually to identify a marketplace. Clearly there is a need for more robust datasets and methods for identifying Classic Maya marketplaces. The Buenavista East Plaza research presented here seeks to address this need. I chose a comprehensive approach to address directly some of the challenges in identifying marketplaces archaeologically and to provide multiple lines of evidence from which to make interpretations. Before discussing the characteristics of the Buenavista region and findings of the East Plaza study, I present the archaeological correlates used to identify a marketplace.

Maya Marketplace Identification

Understanding the distribution of goods and architectural features within a marketplace, the type of activities that took place there and the debris they generated, and the likelihood of any of these preserving in the archaeological record is essential for testing marketplace hypotheses. The following discussion reviews specific marketplace architectural features and activities, their archaeological correlates, and some of the challenges in identifying the correlates as indicators of a marketplace. A summary of these correlates is presented in Table 1.

The most common architectural feature within a marketplace is the vendor stall. Stall types can range from temporary selling

areas where goods are displayed on the ground to permanent stone or wattle-and-daub structures. In any given marketplace multiple types of stalls may be used. Stalls can be arranged in a regular pattern, such as rows, or irregularly. Archaeologically, the remains of stalls that involved disturbing the ground surface and/or non-perishable construction materials are more likely to be identified.

A major archaeological challenge to identifying an architectural feature as a vendor stall is the fact that the physical remains of stalls may resemble those of architecture used for other activities. Therefore, consideration of the type of architectural features present, their spatial arrangement, and their association with artifacts are absolutely essential. In a marketplace, vendor stalls are likely to be closely spaced and separated by walkways relatively clean of debris. In many marketplaces, vendors tend to specialize in selling one class of goods. Additionally, goods of similar type tend to be sold in the same area within a marketplace. These patterns are unique to marketplaces and likely to be recoverable archaeologically.

Goods sold at marketplaces consist of a variety of perishable and non-perishable items. Food, tools, raw materials and other goods needed for daily life are the most common types of items sold in marketplaces. However, more rarely used or attainable goods, such as luxury items, can also be available in a marketplace.

The majority of wares to be sold are brought to marketplaces in their finished form but some may have been prepared in the marketplace itself. For example, food may have been cooked and consumed by marketplace participants. Additionally, unfinished items that are light-weight and easily portable may have been brought to the marketplace to be completed while waiting for customers (Hirth 2009; Keller 2006). In cases such as these, only the final stages of production are likely to be present.

Several factors complicate the discovery of marketplace goods in the archaeological record. First, in the ancient world,

	Architectural Evidence	Artifact Evidence	Soil Chemical Patterns
Exchange of goods	Stalls represented by cobble surfaces and/or postholes or daub outlining the edges. Pathways clear of debris.	Dense, discrete concentrations of macro- and microartifacts of the same material type.	Discrete concentrations of chemical groups associated with other lines of evidence indicative of exchange.
Food preparation	Cooking pits Hearths	Discrete concentrations of food producing or consuming artifacts and/or ecofacts.	High concentration of phosphorous, potassium, and calcium.
Craft production	Cobble work surfaces. Production features such as loom posts.	Debris from production steps involving light weight materials and/or finishing stages of production.	High concentrations of elements associated with material being worked.
Storage of goods	Storage pits.	Although their contents would likely have been emptied during abandonment, they might contain stray finished goods, raw materials, and/or tools of production.	No specific soil chemical pattern.
Maintenance	Successive resurfacing of the plaza surface. Overlapping postholes from repair to structure walls.	Concentrations on the edges of the plaza space representing swept up debris from the main activity area.	High concentrations of phosphorous associated with trash debris.
Administration	Special buildings or facilities adjacent to vending area.	No specific artifact correlate.	No specific soil chemical pattern.

Table 1. Archaeological correlates of marketplaces.

marketplaces were dominated by perishable goods. Rarely do these materials preserve archaeologically, although chemical traces or microbotanicals of them may be recoverable. Additionally, most of the goods brought to a marketplace are removed to be used elsewhere. The goods that do remain in marketplaces tend to be those that were broken. Large fragments of broken items were likely swept or tossed away and deposited in trash piles outside the marketplace space. Smaller fragments however could have been trampled into the marketplace surface and preserved in their primary context (Gifford Gonzalez et al. 1985).

Preservation and issues of equifinality create challenges for identifying marketplaces archaeologically. However, marketplaces do have a unique

archaeological signature (see Cap 2008 and Wells 2003 for non-marketplace plaza studies for comparison) that is recoverable through a combination of traditional excavations and non-traditional methods such as soil chemical and microartifact analysis. To avoid ambiguity, multiple lines of evidence that meet marketplace correlates should be used to make interpretations.

Buenavista del Cayo

Buenavista is a mid-sized site located in the upper Belize River valley, Belize (Figure 1). It was occupied from the Middle Preclassic to the Terminal Classic (950 BC-AD 950), reaching its apogee of power and size in the Late Classic period. Research conducted in Buenavista's site core by Joseph Ball and Jennifer Taschek (1988, 1991, 2004) from 1981 to 1992, under the

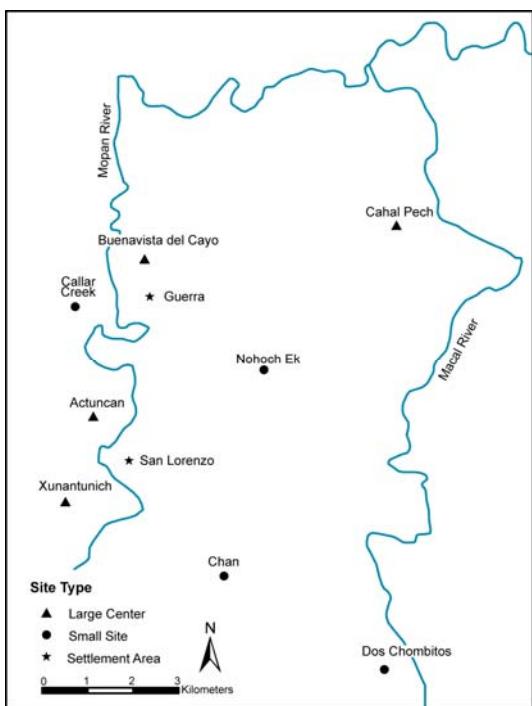


Figure 1. Sites of the upper Belize River Valley.

Mopan-Macal Triangle Project (MMT), provides evidence that it was an important ritual, elite residential, and administrative center. Ball and Taschek (1991:156) suggested that Buenavista may also have been an economic center but were unsure of the extent to which it served as a central node of trade.

Buenavista is an ideal location to test for a marketplace for several reasons. The natural environment of the Buenavista region is quite diverse. In the area immediately surrounding the Buenavista site core, soil quality varies significantly. The site core and households to the north and east are located on the oldest alluvial terrace which is composed of poorly drained clays. Agricultural yield would have been lower than in areas south and west of the site core where young, actively changing, highly fertile, alluvial soils dominate. While food yields may have been lower on the upper terrace, the clays found here could have been a good source of material for making ceramic vessels.

Distribution of stone resources for construction materials and tools also vary. In the area adjacent to Buenavista, available

stone materials included river deposited limestone and cherts. These would have been good sources for creating platform ballast, structure fill, or stone tools and were likely accessible to everyone. However, limestone for large construction projects would have had to have been brought in from other areas within the valley. Artifacts made with granite, obsidian, and jadeite have been recovered at Buenavista but there are no natural sources of them within the upper Belize River valley.

One response to differential access to resources is specialized production. Ball (1993a) identified a ceramic painting workshop that was spatially associated with bone ornament production in the elite residential complex of the site core. Taschek and Ball (1986) recovered evidence of specialized chert celt production in the hinterland village of Guerra, 1 km south of the site core. Meaghan Peuramaki-Brown's research (Yaeger et al. 2009, 2010) in the settlement area just south and adjacent to the Buenavista architectural core indicates not all households were producing goods. Her preliminary findings indicate that the earliest constructed households in this area were more involved in craft production than later arrivals (Peuramaki-Brown, personal communication, 2010). With the combination of differential access to raw materials and evidence of specialized production, the producers and consumers of the Buenavista community could have benefited from a marketplace.

The type of plaza spaces most conducive to marketplaces are those that are larger, easily accessible through large openings between structures, and generally lack non-marketplace architecture. Within the Buenavista site core (Figure 2), I suggest that the East Plaza best fits these characteristics. The East Plaza, constructed early in the Late Classic period (Ball and Taschek 2004), encompasses the largest area (approximately 9400 m²) of all plazas at Buenavista. It also has some of the widest openings between the structures that mark its edges and a gentle slope that leads up to the plaza space. The four structures that delimit

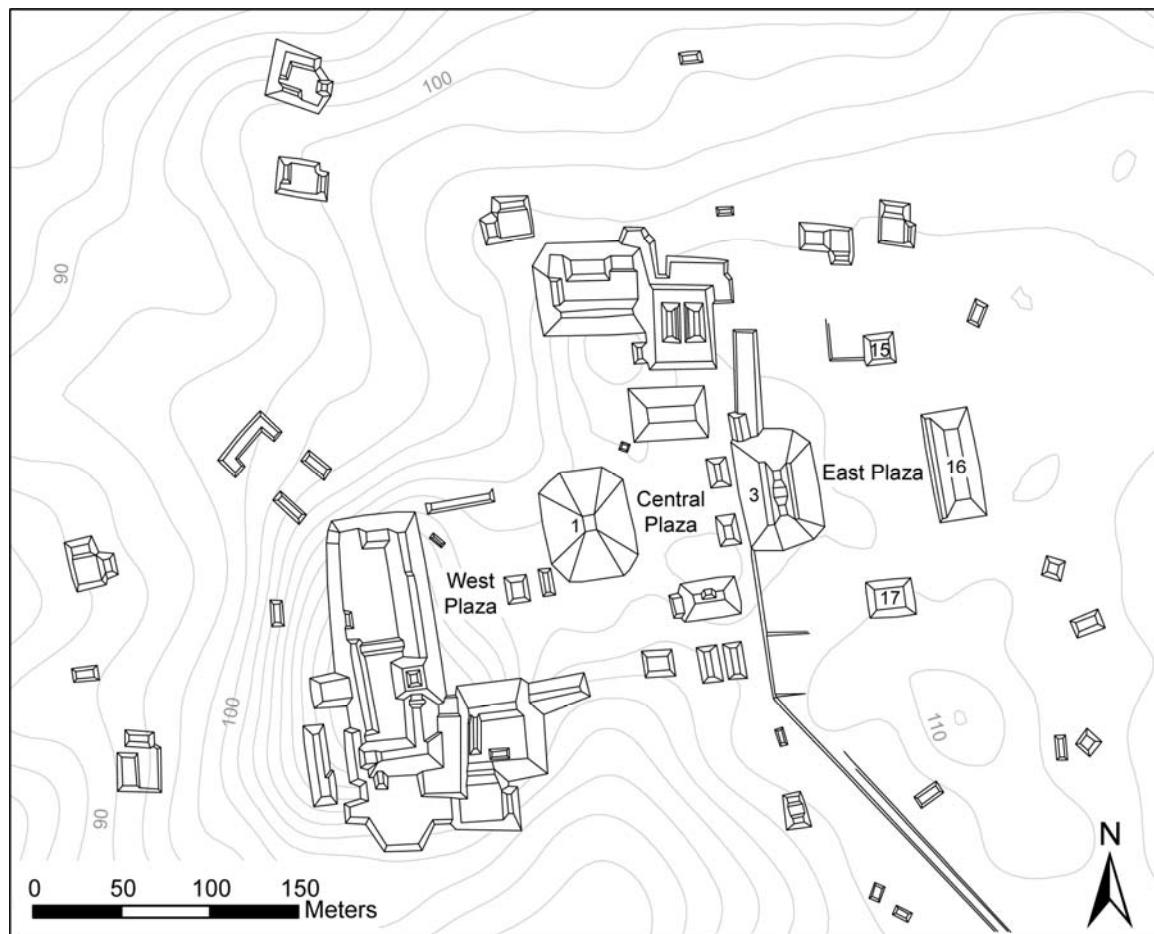


Figure 2. Buenavista del Cayo site core (after Ball and Taschek, personal communication).

its edges are Str. 3, a tall pyramidal structure and Str. 15, 16, and 17, each of which currently has an unknown function, but based on architectural form none are temples or domestic structures. Additional features that would facilitate the marketplace include two aguadas and a causeway leading into the southern sector of the site.

Ball (1993b:56) posited the East Plaza could have been the venue of a marketplace because during limited excavations at the north end of the plaza, near Str. 15, the MMT discovered a dense lens of chert biface production (Kelsay 1985; Reith 2003). The assemblage recovered from this area is dominated by debris from the finishing stages of biface production and contained only a few broken biface fragments (Heindel 2010; Reith 2003). This pattern is not common in primary production

locales, where many more manufacturing failures and blanks are found (e.g., Shafer and Hester 1983; Whittaker et al. 2008) suggesting a different set of behaviors created this deposit.

The background data presented here can be used to suggest Buenavista may have had a need for a marketplace, a venue to host it, and potential producers to supply goods. In order to test this hypothesis, I conducted a comprehensive investigation focused on collection of empirical data to determine the types of architectural features constructed and activities that occurred in the East Plaza.

East Plaza Investigations

I chose a research strategy for this study that was focused on obtaining both large and small scale perspectives of architecture and activities that took place across the East

Plaza. To meet these goals we conducted a remote sensing survey, a systematic shovel test program, and broad horizontal exposure of seven areas in the plaza (Figure 3). During the excavation portion of the project, in addition to collection of macroartifacts, we also collected flotation samples to recover microartifacts (artifacts less than $\frac{1}{4}$ " in diameter) and bulk soil samples for chemical analysis. The results from these methods and analysis of artifacts and soils provide information about the types and spatial distribution of architecture and several activities that occurred in discrete sectors of the plaza. Evidence of activities occurring in the East Plaza initially date to the Middle Preclassic. However, as already mentioned, the East Plaza was not formally delimited as a plaza space until the Late Classic period. Therefore, the results discussed below date to the Late Classic occupation surface.

Architecture

Evidence from remote sensing, shovel tests, horizontal excavations, and microartifact analysis indicates several types of architectural features were constructed in the East Plaza. In excavation Areas 1, 2, 3 and 4 we uncovered a discontinuously preserved limestone cobble ballast of the Late Classic plaza surface. Results of the remote sensing and shovel testing suggest a similar plaza surface likely covered most of the northern half of the plaza. Spatial analysis of the distribution of microdaub (2-4mm in diameter) indicates wattle-and-daub structures were built atop this surface. The microdaub in Areas 1 and 4 is distributed in a linear pattern suggesting the location of a structure wall (Figure 4). In Area 3, we uncovered a different architectural feature; a short, single course of cut limestone blocks marking the edge of a low platform. The only architectural features we were able to uncover fully were two low, closely spaced platforms, each roughly 2 m in diameter found in Area 5. Several large cut and uncut limestone blocks marked the edges of each platform. The variety of architectural features in the East Plaza is intriguing but

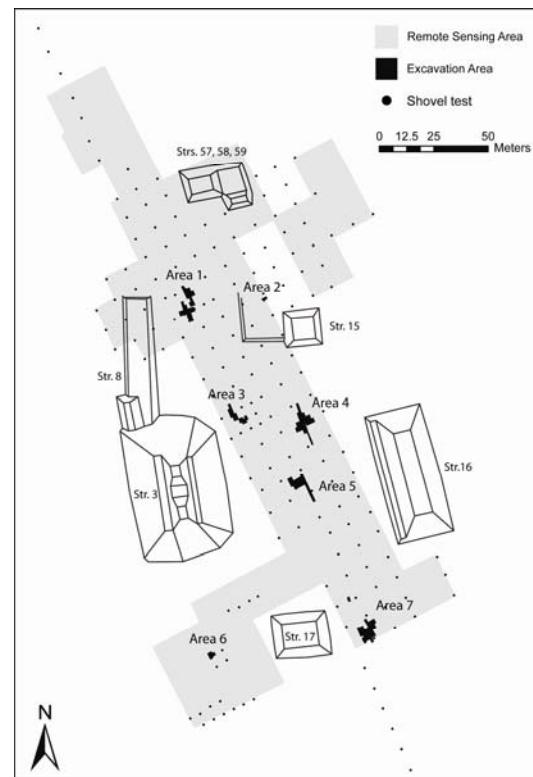


Figure 3. Remote sensing, shovel tests, and excavation areas in the East Plaza.

the reason for these differences is not apparent until examining the evidence of activities associated with them.

Activities and Activity Areas

Drawing on data from macro- and microartifacts and soil chemistry, it appears that several different activities took place within the East Plaza. The major categories of activities I have identified are lithic production, activities involving organic materials, and ritual activities. Interestingly, these activities occur in discrete locations across the plaza space.

Chert biface production took place in the northern sector of the East Plaza in Areas 1 and 2. Area 2 was initially investigated by the MMT and identified as a lithic production zone (Kelsay 1985; Reith 2003). In 2008, Theresa Heindel (2010) conducted further research in this area and found the production zone to cover a 20 m x 30 m area. At its thickest point, the deposit is 25 cm thick with roughly 330,000 lithics per cubic meter. Nearly 25 percent of the

total lithic assemblage in Area 2 was microdebitage suggesting the deposit was created *in situ*.

Heindel's (2010) analysis revealed that roughly 70 percent of flakes in the deposit are from the final stage of biface production. The dominance of end-stage production debris suggests biface performers were brought to the East Plaza and finished there. Only 0.15 percent of the assemblage represents formal tools indicating the bifaces were not made to then be used in Area 2. Interestingly, almost 2 percent of flakes in the assemblage are resharpening flakes suggesting used tools were being reworked in this locale. Area 2 likely represents a small scale or repeated short term production zone devoted to the final stage of biface production.

The western portion of Area 1 also contains a dense amount of end-stage chert biface production debris (Figure 4). The assemblage was collected from an area of 28 m² directly on and above the Late Classic plaza surface. Similar to the Area 2 deposit, microlithics indicate Area 1 is a primary production location. The Area 1 flake assemblage consists of 79 percent end-stage debris with a total density of only 2449 lithics per m³. Similar to Area 2, a very low percentage of the Area 1 assemblage consists of biface fragments. Clearly Area 1 is a smaller scale production area but the dominance of end-stage debris suggests similar activities were occurring in Areas 1 and 2.

Obsidian blade production also took place in Area 1 (Figure 4). The obsidian assemblage in Area 1 consists of 400 macrosized fragments, 23 percent of which represent production debris (e.g., platform isolation flakes, core tablets, shatter, and plunging distal fragments). Microartifacts are also present, suggesting this was a primary production location. Very little cortex remained on any of the fragments and many blades are third series blades which may indicate cores were arriving at the plaza already heavily worked and were perhaps exhausted in the East Plaza. The characteristics of this assemblage are similar

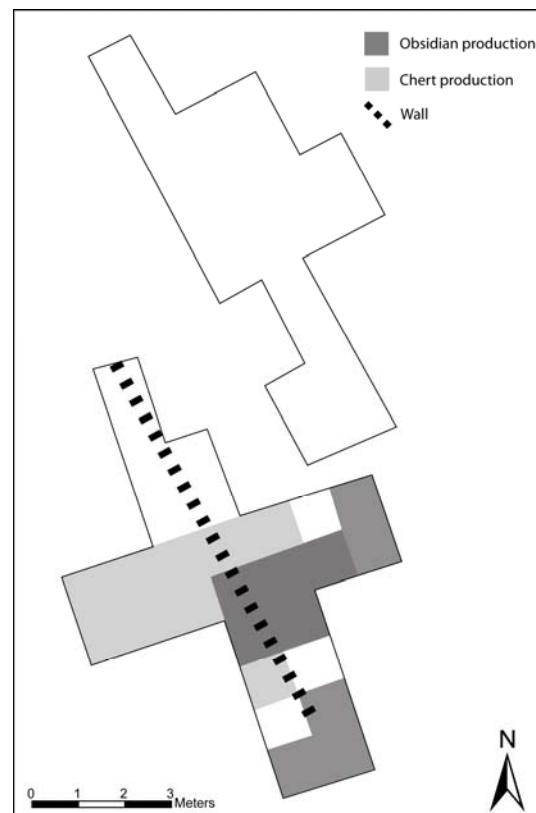


Figure 4. Distribution of chert and obsidian production debris and microdaub in Area 1.

to other obsidian blade production zones, albeit the extent of the Area 1 assemblage is quite small.

Turning to soil chemical and ceramic data, Area 3 has the highest concentration of both ceramics and soil phosphorous (P). Unfortunately, ceramics found in the humus layer of plazas, such as those collected in the East Plaza, are very poorly preserved and tend to be small in size. Therefore, little information about form, size, and type-variety can be obtained. However, the highest concentration of ceramics within the East Plaza correlates with the highest levels of soil P. Areas with high levels of P are typically where many organics were used in either one episode or saw repeated use of organics over time (Eidt 1977; Hassan 1978). The correlation of the ceramic and P distributions in Area 3 may indicate the ceramics functioned to hold organic materials such as comestibles or other organic materials. The strong spatial patterning of both the highs and lows of soil

P also indicates organic materials were differentially used across the East Plaza.

Finally, ritual activities of religious and/or political importance likely occurred in the center of the plaza in excavation Area 5. As previously mentioned, we uncovered two low platforms in Area 5. Above the west platform we found a broken chert eccentric and below it a broken jade ornament. Eccentrics are rarely found outside specially cached deposits and are highly charged items (Iannone 1992; Meadows 2001). Likewise, jade holds significant religious and political meanings in Maya society. Artifacts and architecture such as these have been found in plazas at the nearby Chan site (Blackmore 2003; Cap 2008) where they also have been interpreted as remains of ritual activities.

Discussion

Do the archaeological materials recovered in the East Plaza represent a marketplace? Several of the marketplace correlates listed in Table 1 are present in the East Plaza. It is the combination of these correlates, derived from multiple types of data that lead me to conclude that a marketplace was held in the East Plaza during the Late Classic period.

First, we uncovered discrete concentrations of artifacts throughout the plaza that are associated with various forms of architecture. I suggest these patterns represent vendor stalls and the typical separation of goods by type seen in historic and modern marketplaces. Clearly, lithic production and activities involving organic materials and ceramics were segregated from each other. At a smaller scale, microartifact patterns indicate there is additional separation of chert biface production from obsidian blade production (Figure 4).

A second marketplace correlate present in the East Plaza is the abundance of end-stage lithic production debris. As stated previously, the predominance of the final stages of biface production is not reflective of other lithic deposits associated with households, quarries, or workshops.

Something different was taking place in the East Plaza. A possible explanation for the creation of the East Plaza lithic production deposit is that seller-producers brought tools and prepared cores to work during the marketplace meeting. The knappers could have made and/or resharpened tools while awaiting customers or as customers requested items. The small size of the East Plaza deposit may be due to cleaning practices and/or a slow accretion of debris over many marketplace meetings.

This pattern of lithic debris is not unique to Buenavista. Similar deposits have been found in plaza contexts at the Central Mexican site of Xochicalco, where Hirth (2009) recovered large amounts of obsidian production debitage, and at Xunantunich, where Keller (2006) found both chert and obsidian production debris. Combining lithic and architectural data, both Keller (2006) and Hirth (2009) suggest the plazas they investigated are likely marketplaces.

The evidence for ritual activities in the center of the plaza is intriguing. Were rituals performed in association with the marketplace? Because public plaza spaces were used for a variety of activities it is possible that ritual activities took place between marketplace meetings.

If a marketplace was held in the East Plaza, then this has important implications for understanding economic organization in the Buenavista region. First, it appears that producers and customers were interacting directly with one another. While this does not negate the idea of middlemen vendors, buying directly from the producer has different economic consequences (Yaeger 2010). Second, a variety of goods were found in the East Plaza, and they are largely utilitarian. This information can be used to assess how individuals could supply their households with these goods. Next, the presence of obsidian blade producers in the East Plaza brings about questions of interregional communication and who exactly was making the obsidian blades. Large scale obsidian production has been found at other sites in the Belize River valley (Hintzman 2000; Olson 1994). Were

obsidian specialists from the valley supplying blades for the Buenavista marketplace or were non-local blade makers traveling to the site? This is important to consider because the two scenarios would involve different exchange networks. Finally, identifying a marketplace in the architectural core of Buenavista has ramifications for understanding the multipurpose roles of the site center.

Marketplaces have been viewed as difficult to identify archaeologically. However, few researchers have conducted empirically driven investigations of potential marketplace spaces. The study presented here indicates that by using a comprehensive approach that strives to obtain broad and small scale patterns using multiple data sets much information can be learned about public plaza spaces and ancient Maya marketplaces.

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21 THE ARCHAEOLOGY OF ST. GEORGE'S CAYE, BELIZE: RESULTS OF THE 2009 FIELD SEASON

James F. Garber, Jaime J. Awe, Lauren A. Sullivan and Jennifer L. Cochran

Belize's historic past is full of high adventure: tales of Caribbean pirates, shipwrecked treasures, and battles between Spain and England over rights to the Central American nation. Hurricanes, fires, and centuries of conflict have obscured the historical record. Consequently, several versions exist of Belize's history, sometimes contradictory and mixed with myth. In the summer of 2009 Texas State University and the Belize Institute of Archaeology initiated a project to investigate the initial English settlement of what is now known as Belize.

Introduction

St. George's Caye is a relatively small island approximately eight miles east of Belize City (Figure 1). It is a part of the extensive reef system protecting the Belize coast. Because of its strategic location and shape, this small island played a key role in the history of Belize. From the mid-1600s, British pirates and buccaneers used the cayes as hiding places and ports for repairing their ships. Sometime in the early 1700's St. George's Caye became the primary residence of the early English settlers that extracted logwood and later mahogany from the mainland. Additionally, it functioned as the Settlement's first capital. It is also known for the 1798 Battle of St. George's Caye which was Spain's last attempt to take the English settlement by force. This article reports the results of the first field season of the Texas State University St. George's Caye Archaeology Project.

The St. George's Caye Archaeology Project is a ten-year project composed of archival research, archaeological excavation, and the underwater examination of shipwrecks. The result of our initial archival research is reported elsewhere (Garber et al. 2010). Our first field season was a short one of only 10 days in the summer of 2009. There were four main objectives of the first field season: 1) recording the cannon of St. George's Caye; 2) metal detector survey; 3) probing survey and test excavations in the cemetery; and 4) archaeological test excavations at various locations on the caye.



Figure 1. Area map – Belize City and Cayes.

2009 Field Investigations

The Cannon of St. George's Caye

At the present time, there are two cannon visible on St. George's Caye (Figure 2). The smaller of the two is currently in front of the Searle house (Figure 2b). It was recovered in Belize City in the Newtown Barracks area and moved to its present location in recent times. It is not directly related to the history of St. George's Caye.

The larger of the two is situated on the mid-point of the island facing the sea (Figure 2a). A plaque indicates that it was placed in its present location in 1972. This cannon has been on the island as long as residents can remember. The project crew took measurements of the cannon and produced a detailed drawing (Figure 3). Measurements indicate that this is an 18-pounder long gun. Poundage refers to the maximum weight of a solid iron ball that could fit the bore with approximately 1/4 inch



Figure 2. The cannon of St. George's Caye; a) 18-pounder long gun; b) 9-pounder in front of Searle house.

allowable for windage. The maximum range of a cannon of this size is 2.25 miles, but accurate within one mile.

Residents also note that a similar cannon was removed from the island by helicopter and taken to Belmopan. This is the cannon in Independence Plaza in Belmopan (Figure 4). Measurements of the cannon indicate that it is of similar size but the differences are sufficient to indicate that it was made from a different casting mould. We have been unable to locate any records as to when either of these large cannon were placed on St. George's Caye or the circumstances of their use. It is important to note however, that records indicate that the Towser and the Tickler, two private sloops in the Battle of St. George's Caye, were each fitted with an 18-pound cannon. The archives are silent as to what happened to these cannon, but it may be that these two large cannon (one on St. George's Caye, one in Belmopan) are those that played a role in this important battle.

Residents also informed us that there was once a smaller cannon on the island in

the general location of the Biddle house which was destroyed in hurricane Hattie in 1961. They also indicated that this cannon was buried by local residents at about the same time that the larger cannon noted above was removed from the island by helicopter. The Biddle house "Lesmore" is shown on the back of the Belize 5 dollar bill. A small cannon is shown in the foreground. Interestingly, the Mermaid, another private vessel used in the Battle of St. George's Caye, was fitted with a 9-pound cannon. The one that was buried by residents may be the cannon from the Mermaid.

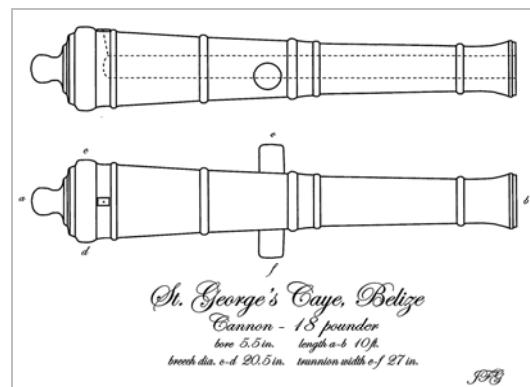


Figure 3. Drawing of 18-pounder long gun on St. George's Caye. Drawing by James F. Garber.



Figure 4. 18-pounder long gun cannon in Independence Plaza, Belmopan.

Metal Detector Survey

A metal detector was used during the 2009 field season to identify the location of buried metal artifacts or metal features associated with the early historic period. This metal detector (Mineland-Safari) is a highly sensitive, full band spectrum device

that can locate and identify a variety of metals such as iron, aluminum, copper, lead, silver, and gold up to a depth of approximately 2.5 feet.

In order to better determine the sensitivity, accuracy, and usefulness of the device, a small land tract was tested. This property, owned by John Searle Sr., was surveyed with the detector over the entire property. The presence of several metal artifacts was indicated. Shovel testing showed these to be modern metal items consisting of bolts, bottle caps, nails, nuts, and wire.

At the outset, we were optimistic about the use of the metal detector as a useful tool for locating historic era artifacts and areas of historic activity such as workshops, middens, etc. Unfortunately this was not the case. The device proved to be too effective. Due to a substantial amount of modern activity, modern metal items such as nails, bottle caps, wire, etc. are present in most areas of the island that we checked. The device cannot discriminate between old and new and thus it proved to be of little use.



Figure 5. Cemetery on St. George's Caye, Belize.

The Cemetery at St. George's Caye

Were it not for a one modern era burial crypt and a few modern memorial markers, one would hardly know the St. George's Caye cemetery was a burial ground much less the oldest non-Maya historic cemetery in Belize (Figure 5). Virtually all signs of its once striking appearance have been obliterated by storm surges, hurricanes, vandalism, and the ravages of time. Records indicate that the cemetery was reasonably

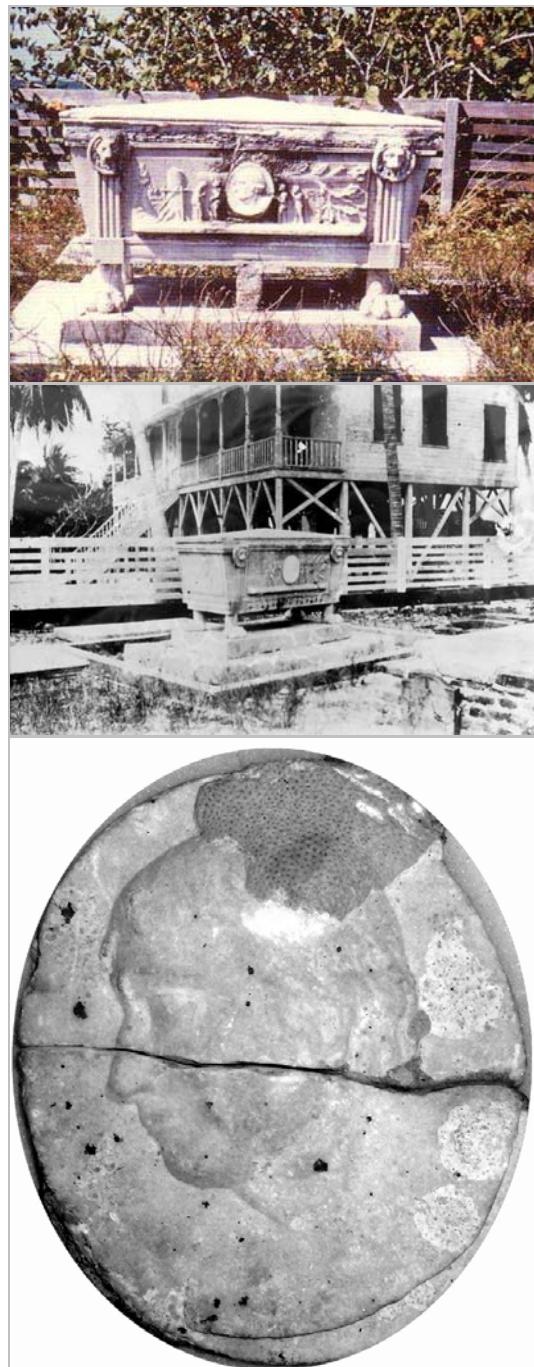


Figure 6. Burial crypt of Thomas Potts in St. George's Caye cemetery: a) photo from Frazier collection; b) photo hanging in bar of St. George's Caye Resort; c) photograph of the marble medallion recovered at St. George's Caye currently curated at the Institute of Archaeology, Belmopan.

well maintained into the 1920s. Destruction began with the hurricane of 1931 followed by hurricanes Hattie in 1961 and Greta in 1978. Hurricane Hattie did significant

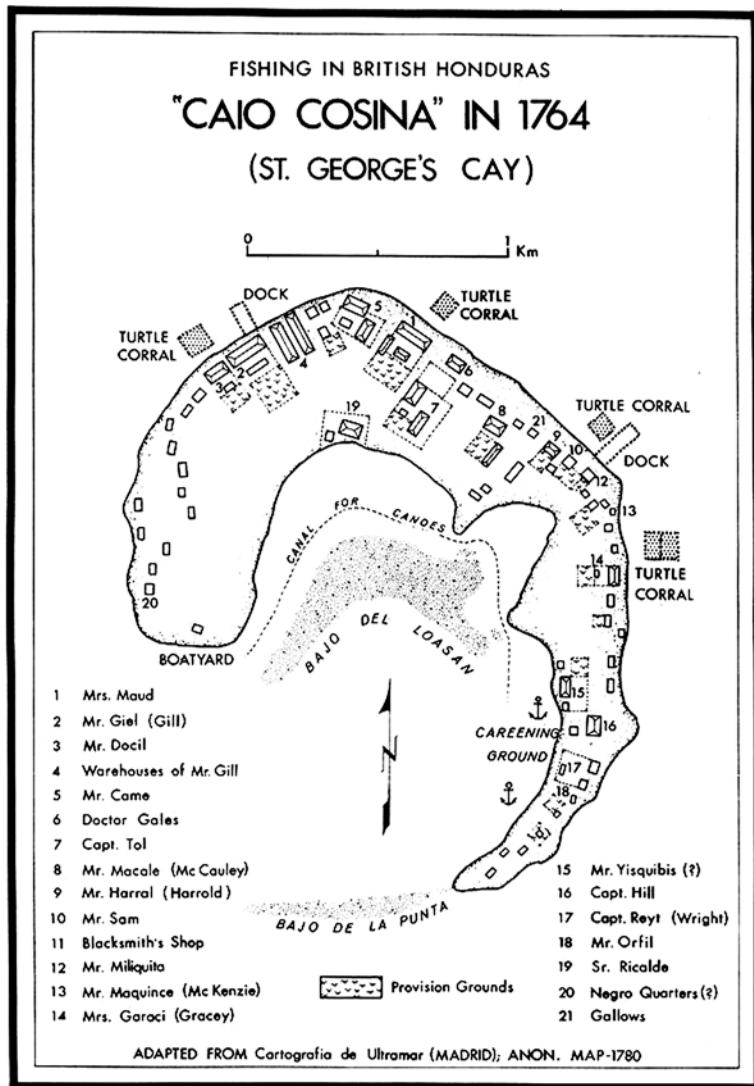


Figure 7. 1764 Spanish map of St. George's Caye (Cayo Cosina). From Craig 1966.

damage to the cemetery cutting an E-W channel across the width of the island, removing the southern edge of the cemetery and the cemetery's most notable marker, the elaborate above ground burial crypt of Thomas Potts (Figure 6). This crypt is shown on the back of the Belize five-dollar bill. According to residents, the crypt slid into the cut, which was later filled in to prevent additional erosion. The exact location is not known but it is apparently now outside the limits of the cemetery wall. Erosion from hurricane Greta in 1978 exposed a marble medallion that appears to be from the Potts tomb (Figure 6d).

Photographs of the cemetery taken prior to the hurricanes (Figure 6b) indicate that it was once very similar in appearance to Yarborough Cemetery in Belize City. The graves typically consisted of a low rectangular platform composed of coursed red bricks held together by coarsely tempered cement capped with a large white marble or black sandstone slab upon which is an inscribed epitaph. These bricks were brought over from Europe as ballast in the hulls of ships and were used in a variety of building constructions such as St. John's Church and older buildings in Belize City. Residents indicate that there were once

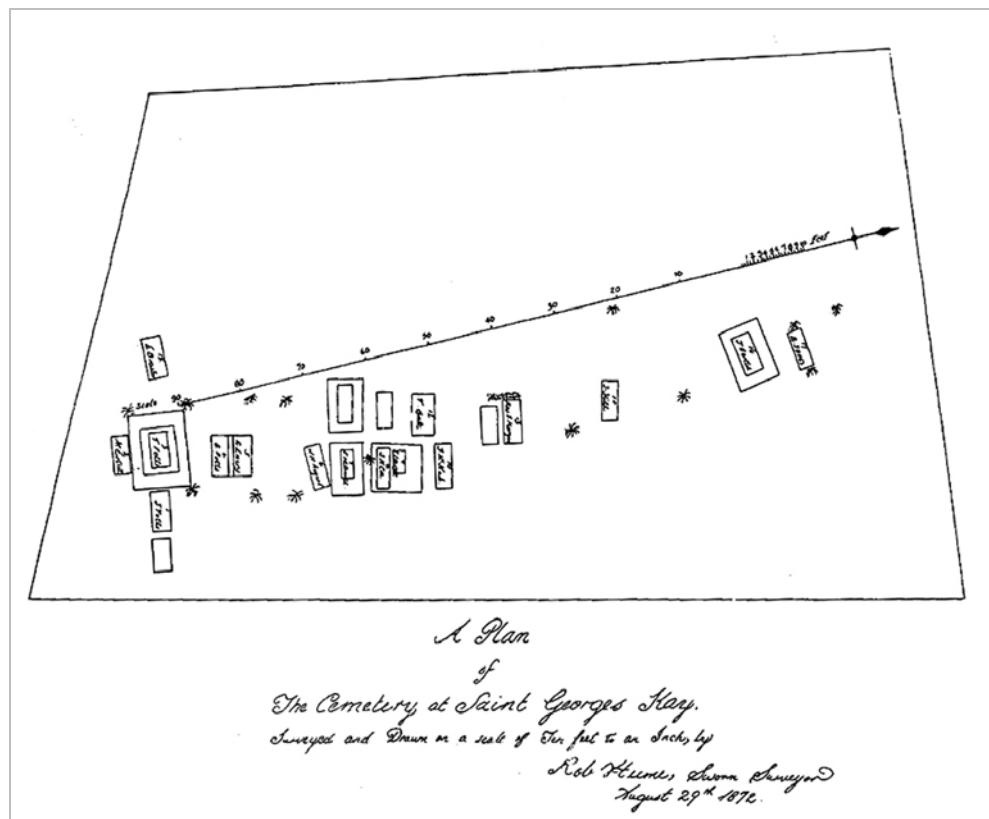


Figure 8. 1872 plan map of St. George's Caye Cemetery by Rob Hume.

numerous unmarked graves in the St. George's Caye cemetery as well. This was confirmed in the 2010 field season which will be reported in a future publication. Residents also note that after the hurricanes had broken up many of the stones, lobster fishermen used them for ballast in their traps.

St. George's Caye was the primary habitation for the initial English settlement and served as Belize's first capital. The cemetery on St. George's Caye is the earliest known European cemetery in Belize. It and the slightly later Yarborough Cemetery in Belize City were known as the burial grounds for the congregation of St. John's Church.

Records do not indicate when the St. George's Caye cemetery was initially established. It is not shown on the 1764 map (Figure 7). The earliest carved stone on record is 1787, but there were undoubtedly unmarked graves that predate this. A map made in 1872 documents the location of 20

graves in the cemetery (Figure 8). Prior to the destruction of the hurricanes, James Purcell Usher recorded 21 epitaphs (Usher 1907). In 1926 Thomas Gann notes an additional seemingly early but undated epitaph: "In Reverent Memory of George Hume, Mahogany Cutter and Bayman but God Fearing" (Gann 1926:24). In her exhaustive study of the cemeteries of Belize City, Mary Check-Pennel (1989) documents eight additional burials. In modern times, a handful of memorial stones have been placed in the cemetery. These are stones only and were not placed there in association with burials.

The objective of the probing survey was to locate any gravestones still present below the ground surface. A grid was measured out on the cemetery grounds within the boundaries of the modern cemetery fence. This grid was marked at approximately one-meter intervals in both the north-south and west-east directions. The ground was probed at each of these intervals using a 1.5



Figure 9. Burial crypt found in XU7. The markers in the upper right and upper left are memorial stones that are not associated with burials.

meter solid copper grounding rod approximately $\frac{3}{4}$ inch in diameter. The objective of the probing was to locate anomalies beneath the surface. The copper rod was pushed into the ground until it was stopped either by an anomaly or the hardpan layer. A probe spot was considered positive if something was located other than the hardpan layer overlying the water table. These locations were flagged for further investigation. When a probed location tested positive, probing in all directions around the positive location at approximate 10 cm increments was used in order check the depth and extent of the anomaly.

The probing survey conducted in the cemetery helped to locate the approximate edge of the channel cut by hurricane Hattie as noted earlier. The fill associated with the channel was loosely compacted and no hardpan layer was present. The copper rod easily went into the ground the full length of the rod (1.5 meters) in this location. Probing indicated that the north edge of the channel cut into the southern portion of the cemetery angling in a SW direction.

A 2x1 meter unit was centrally located in the northern half of the cemetery 8 meters

east of the west cemetery boundary. The objective of this unit was to examine a large anomaly identified through probing. The anomaly was the approximate size of a burial crypt. The unit was placed over the edges of the anomaly as defined by the probing.

Level 1 consisted of the removal of soil overlying the anomaly. The matrix consisted of light grey coarse sand with a high percentage of stone and shell inclusions. Fragments from red bricks and small pieces of glass were recovered. This level terminated at the presence of a rectangular feature composed of coarsely tempered tan cement. It measured roughly 2x1 meters with the longer dimension in an east-west orientation (Figure 9). A smaller rectangular opening was present in its center. This space was large enough to fit an adult of small stature. The edges framing the opening were about 25 cm thick on all sides.

Level 2 consisted of the removal of the soft matrix located within the rectangular opening. This matrix was carefully excavated, however, no human remains were recovered. The above ground brick portion of the crypt was likely removed by hurricane activity. As a result, the individual located in this crypt would have been displaced. Level 2 was terminated approximately 50cm below ground surface at the base of the concrete portion of the crypt. Few artifacts associated with the grave were recovered.

In the summer of 2010 these excavations were expanded two meters to the east (Figure 9). These excavations revealed the presence of three mahogany coffins (each with human remains), the cement top of the crypt revealed in 2009, and skeletal remains that had probably been washed out of that crypt. These investigations will be presented in a forthcoming report.

Button of the 7th West Indies Regiment

A button of the 7th West Indies Regiment was recovered in the excavations within the back (west) end of the St.



Figure 10. West Indies Regiment buttons; a) 7th regiment (pewter); b) 5th regiment (pewter); c) 2nd regiment (brass).

George's Caye cemetery (Figure 10a). Although historical documents indicate that several detachments of various West Indies regiments (1st, 2nd, 3rd, 5th, and 6th) served in Belize, the 7th was apparently never assigned there. There is however, a connection between the 7th West Indies Regiment and Belize. This connection lies in the military history of one of the Settlement's Superintendents, Lt. Colonel George Arthur, who served in that position from 1814 to 1822. Before exploring that connection, background information on the West Indies Regiments is presented below.

In the late 1700s, Britain was defending its Empire in various parts of the world and thus there was a severe shortage of troops. Troops shipped over from Britain did not do well in the tropical environment of the Caribbean and casualties resulting from climate adjustment and disease were high. To meet this shortage, commissions were issued in 1795 to Colonels of the British army to raise eight regiments (more regiments were added later). These initial eight regiments were formed in Jamaica, the British stronghold in the Caribbean. These were to be commanded by white officers and NCOs and consist of black troops many of which were slaves purchased for that purpose.

The 7th West Indies Regiment (also known as Lewe's or Lewe's Foot) was commissioned on September 1, 1795. It was disbanded in 1803 and reformed with troops

from the 9th, 10th, and 12th. It was permanently disbanded in 1819. Soldiers of the West Indies 7th Regiment that were unfit for active service but appropriate for garrison duty were assigned to the Black Garrison 1st company formed in Jamaica on August 1, 1813. This company was disbanded in Trinidad on August 24, 1817. Additionally, some soldiers of the West Indies 7th Regiment were incorporated into the Black Garrison 2nd company formed in Curacao on June 25, 1815, transferred to Jamaica in March 1816, and disbanded July 24, 1817.

The uniforms of the West Indies 7th Regiment consisted of the following: red jacket (eight buttons below half lapels); yellow jacket facings; red collar (one button and laced button hole on each side); shoulder straps; half lapels (each with three buttons and laced buttonholes); yellow pointed cuffs (two buttons each); short tails; regimental lace (white with brown, yellow, and scarlet line 1802; white with black and yellow line 1814; officer's lace was silver) edged the collar, shoulder straps, top of cuffs, and was used for the button holes of the half lapels and collar; sergeants had same jacket but in scarlet with white silk lace; accoutrements in black; pants were white duck gaiter-trousers from 1795 to July 7, 1810, after that pants changed to blue serge gaiter-trousers; hats were black round with whole brim until 1803, followed by black stovepipe shakos, followed by

'Belgic' shako issued from 1812-1813; officers wore black bicorn hats in dress uniform and round hats in undress uniform (Chartrand 1996). Figure 11 shows a private of the 5th West Indies Regiment. The uniform is basically the same as those of the 7th with minor differences in regimental trim.

Sometime after its commission in 1795, the 7th Regiment was assigned to Saint-Domingue (the British called it San Domingo, today it is called Haiti) and served there until December of 1798. On July 7, 1809 the West Indies 7th Regiment along with several other military units, captured the city of Santo Domingo (now in the Dominican Republic).

As noted above, various West Indies regiments (1st, 2nd, 3rd, 5th, and 6th) served in Belize, but the 7th was apparently never assigned there. The connection between the 7th West Indies regiment and Belize lies with Lt. Colonel George Arthur (Figure 12). His military career began in 1804. He served in Calabria, Egypt, Sicily, Jersey, and the Walcheren expedition. In 1812 he purchased a majority of the 7th Regiment and soon after was given the post of assistant quartermaster general in Jamaica where the 7th was formed. Here he began his career with the Colonial Office and was appointed Superintendent of the Bay Settlement (Belize). He served in that post from 1814-1822. Like most of the Superintendents of the Settlement, his role was controversial. It is important to note that at this point in time, the Bay Settlement was not a colony of Britain and as per treaty agreement with Spain, the Baymen were allowed to settle, cut and export wood, but not establish a government or plantations. The role of Superintendent was to serve as the Crown's representative and the duties and power were ambiguous and constantly shifting. The only clear role was to ensure that treaty regulations with Spain were enforced. Superintendents did not have the power to govern. It was truly a unique situation in the British Empire without parallel. The "law of the land" at that point in time was Burnaby's Code, established in



Figure 11. Private of the 5th West Indies Regiment. Uniforms of the 7th regiment were basically the same except for minor regimental distinctions. From *Costumes of the Army of the British Empire, according to the last regulations 1812*. Engraved by J. C. Stadler, aquatint by Charles Hamilton Smith.

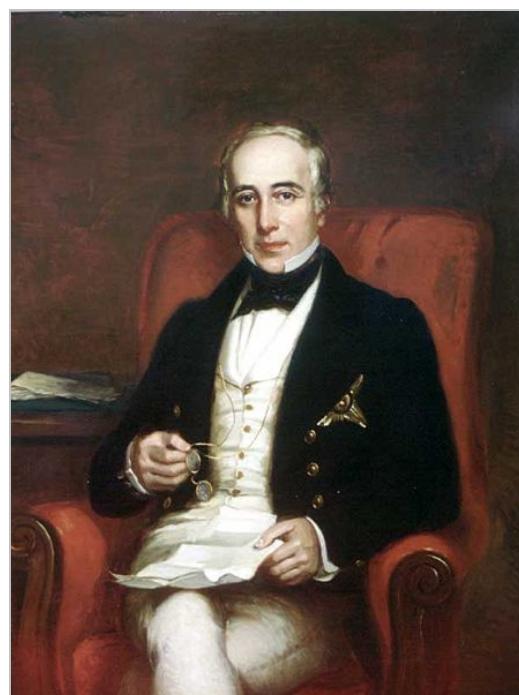


Figure 12. George Arthur. Superintendent of the Bay Settlement 1814-1821.

1765 on St. George's Caye. It is clear from the records that George Arthur played a key role in strengthening the Crown's role in the affairs of the Settlement. Also of historical importance to Belize, he was the first Superintendent to occupy the then newly constructed Government House that still stands today (it is now the House of Culture). Previous Superintendents lived at the upper end of Haulover Creek.

This brings us back to the West Indies 7th Regiment button recovered in the St. George's Caye cemetery. The button is made of pewter and is thus that of an enlisted man (officers buttons were made of silver). If the 7th Regiment was never assigned to Belize, how did this button find its way to St. George's Caye? We have two possible explanations. When George Arthur was assigned to Belize, perhaps he brought with him a few of his best men to assist him in his new assignment. The archives are silent on this issue. It should be noted that in the same excavation unit in the cemetery we also recovered two smaller unmarked buttons of brass and a buckle. The buttons may be of the type found on each side of the military hat between which was a braided decoration. The buckle, also plain, may have been for some other part of the uniform. As noted earlier in this report, the graves have been severely disturbed by hurricanes and storm surges. One of the crypts excavated in the summer of 2009 had been entirely emptied of its contents, most likely by a storm surge. The buttons and buckle were recovered from the back of the cemetery. Did one of these disturbed graves once contain the uniformed remains of a soldier of the 7th West Indies Regiment?

The other possible explanation lies in the analysis of a skeleton found eroding from the banks of the Mopan River in the Town of Benque Viejo along the western border of Belize (Palacio 1976). The partial skeleton was that of a male who apparently died an accidental death along the river. Amongst the bones were several buttons - two of the 2nd West Indies Regiment; seven of the 3rd West Indies Regiment; and four plain buttons made of bone. In reference to

the wearing of different regimental buttons Palacio notes:

Although this would at first seem to be strange, I am told by present police officers that it is not unusual. Friends in different regiments may exchange buttons as souvenirs. These could be substituted for one's own regimental buttons in times of crisis. When military supplies ran short here in the last century, as they often did according to written sources, buttons were probably the most easily interchangeable items among the regiments. Since seven out of the nine buttons are of the Third Regiment, it seems almost certain that the man belonged to that regiment. (Palacio 1976:16).

Is it possible that what we recovered on St. George's Caye are the remains of a soldier of a West Indies Regiment that was assigned to Belize and that he had replaced a missing button with one he had acquired from a soldier from the 7th that he had met in Jamaica or elsewhere in the Caribbean? Excavations conducted in 2010 revealed numerous buttons including those of the 2nd and 5th West Indies Regiments (Figure 10b and c). These excavations will be presented in a forthcoming report. Preliminary analysis indicates that the back (west) end of the cemetery was converted to a military barracks in the late 1700s.

The 1764 Map

A version of a 1764 map of St. George's Caye was published in 1945 (Figure 7). The original is in the archives of Spain and its maker is unknown. In a previous publication (Garber et al. 2010), we were able to correlate several of the awkwardly spelled English names (map made by someone who only spoke Spanish) with the signers of Burnaby's Code which was signed on St. George's Caye the following year). We suspect that the map was made during a Spanish inspection of the Bay Settlement after the Treaty of Paris in 1763. One of the conditions of the Treaty was that

the British were to dismantle any forts at Black River on the Mosquito Shore and in the Bay Settlement (Belize). Others have suggested that the map was drafted by a Spanish spy.

This early map shows the locations of residences, provision grounds, slaves quarters, gallows, docks, turtle corrals, and a careening ground. We overlaid the 1764 map to the modern survey map of the Caye to get some idea of the spatial relationship between the locations of early documented structures and modern land tracts. Once overlaid, there was some difficulty with the alignment of the maps to one another. The differences between the two maps are no doubt the result of both the accuracy of the 1764 map and the changes in the island topography over time due to hurricanes and modern infilling to raise low and or washed out areas of the island. Residents informed us that in years past they had observed numerous metal objects in the water and ballast stones in an area that corresponds to the blacksmith area, dock and turtle corral. We decided to investigate this area with a small excavation unit placed in shallow water in an area where we had located through probing what we suspected was ship ballast.

This unit was placed approximately 16 meters east of the modern sea wall and 12 meters north of a modern wood dock. This location was on the windward side of the island in shallow water 50-70 cm below sea level. The matrix removed from this unit was wet screened and removed in one level. The unit was terminated at large feature approximately one meter below the sea floor. Further investigations identified this feature as several boulders of dark stone that is not native to the area. These stones would have likely been used as ship ballast and may be associated with the dock shown on the 1764 map. Probing indicated that the ballast pile is approximately 6 m N-S by 6 m E-W. Additional survey of the area surrounding this unit identified several small piles of ballast on the sea floor near a modern wooden dock approximately 12 meters to the south. Several historic

artifacts were recovered from the excavation unit including glass bottle fragments, clay pipe bowl fragment, and several fragments of marine turtle carapace.

Conclusion

St. George's Caye played a critical role in the early history of Belize serving as its first capital and primary residence for the initial English woodcutters. Fires, hurricanes, and conflict have obscured Belize's early historic record. The Texas State University Archaeology Project was initiated to examine the archival record and archaeologically investigate the remains of the initial English settlement. Our research confirmed the presence of a rich archaeological record the examination of which will shed new light on this poorly understood era of Belize's history.

Acknowledgments We are grateful to the Institute of Archaeology for their support and encouragement to initiate this project. We also thank the residents of St. George's Caye who have granted us permission to conduct investigations on their property. Last but not least we wish to thank John and Linda Searle for their hospitality and immeasurable logistical support of this endeavor.

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22 RESULTS OF THE 2010 MAYA POTTERY WORKSHOP

James J. Aimers

As large amounts of excavated pottery continue to accumulate in Belize, archaeologists are faced with a number of challenges which will require coordinated efforts to address. In this paper I discuss challenges and prospects with reference to findings from the Belize Ceramic Workshop 2010 and my ongoing research on type-variety methodology. Some of the challenges include developing standards of analysis and presentation of pottery data, and the need for physical and electronic comparative collections. Prospects are related to the cultural and historical relevance of ancient Maya pottery in Belize, as well as the range of method and theory applied to pottery by archaeologists working in Belize.

Introduction

Belize is central to the study of ancient Maya pottery for a number of reasons. The area that is now Belize was linked to cultural activity in the northern lowlands, the Peten, and along the Caribbean coast. Ceramic assemblages from Belize now include some of the earliest well-documented ceramics in Mesoamerica (the Cunil complex) and some of the most important late collections. In terms of method and theory, Gifford's work on the ceramics of Barton Ramie (especially Gifford 1976) remains influential in Maya pottery studies generally. As large amounts of excavated pottery continue to accumulate in Belize, archaeologists are faced with a number of challenges which will require coordinated efforts to address. In this paper I discuss challenges and prospects with reference to findings from the Belize Ceramic Workshop 2010. I focus here on type-variety classification because its use is widespread in Belize.

Discussion

Some of the challenges for pottery studies in Belize include developing standards of classification, analysis, and presentation of pottery data, and the need for physical and electronic comparative collections. These issues were some of the general topics discussed at the pottery workshop, although a major goal of the workshop is also to allow archaeologists to see samples of pottery from sites other than the ones at which they work.

On the most general level, there is frequently a lack of understanding about

what types are, and how and why they are created. One common misconception is that there is one true or correct way to create types. Some people who attend the workshop may be hoping that there is an easy-to-learn template for pottery classification and analysis but people create new types—or not—for a number of reasons and in a number of ways. Research questions direct which attributes we consider in making types and how much priority we give those attributes in the hierarchy of type-variety (Dunnell 1971a; 1971b; 1986). Furthermore, a type-variety *analysis* involves more than just fitting sherds or, if you're lucky, full vessels into established type-variety categories (ware, group, type etc.) but instead involves creating taxa with reference to context (ideally stratigraphic context), frequency, and association, and creating new names if needed or using established names if similarities are close (Rice in press).

Those who consider matching excavated sherds to published illustrations as a form of “analysis” are denying the need for contextual and quantitative validation, not to mention the need for first-hand examination which is why seeing other people's pottery is so important. Sometimes we have no choice but to work without reference to context (e.g., looted vessels) but usually we do have some sort of context. People who go no further than matching their sherds to Gifford (1976) or any pottery monograph are subscribing to an idea that virtually no ceramic specialist accepts anymore—the idea that types are “real”. What do I mean

when I say types are not real? Well, on one hand, types do have a reality because they are clusters of attributes that interest us and can be observed. On the other hand, types are not real because depending on your research questions you will be interested in different attributes and will define your types accordingly. So the type is imposed by the analyst even if it does have an analytical reality.

Still, it is clear that we frequently can assign a given sherd or vessel a type-variety name based on existing classifications, otherwise there would be no point in creating taxa to begin with. A major problem lies in the fact that, as Lisa LeCount pointed out in the 2010 workshop, sherds or pots are not type fossils—a given type does not have to occur at the same time in all places. Types can persist through multiple phases or occur at different times. LeCount noted that Garbutt Creek Red is found in the Late Classic period in most of the Belize Valley but it is found in the Terminal Classic period at Xunantunich, probably because the site's new Terminal Classic alliances with the lower Belize Valley start bringing in Garbutt Creek Red at that time. Chan Pond Unslipped (a micaceous type) extends from Late Preclassic into the Early Classic and possibly the Late Classic but without contextual validation similar micaceous sherds would be placed in the Protoclassic because that is where Chan Pond Unslipped occurs in Gifford's (1976) Barton Ramie Study.

A similar example is Rio Juan Unslipped in the Postclassic period at Barton Ramie. From the point of view of the Barton Ramie sample, Rio Juan Unslipped is an example of what Gifford (in Willey, et al. 1965:377) called the "local ceramic degeneracy" of the New Town complex which showed that people in the Belize Valley had forgotten how to make pottery properly after the Classic Period. In fact, ceramics of this ceramic system appear in the Preclassic on the central coast of Belize and continue throughout the whole sequence in that area. As I have noted elsewhere

(Aimers 2009), their appearance in the Belize Valley probably represents migration of people into the Belize Valley after the Classic period with a long-lived utilitarian pottery tradition rather than degeneration. One must do type variety contextually to see this and that context can be as limited as a single test pit to as vast as Mesoamerica. Furthermore, reliance on matching the sherds from the coastal areas to Gifford's work would mistakenly assign them to the Postclassic when they in fact predate that period on the coast.

It is not difficult to understand why archaeologists working in Belize are so susceptible to the "match the sherds" method—we are both blessed and cursed in Belize to have as our major ceramic monograph Gifford's (1976) Barton Ramie study. Furthermore, in his extended methodological introduction to the book Gifford argued that ceramic units are both analytically and culturally real. So, for example, Gifford suggested that a variety is the physical manifestation of the smallest unit of ceramic production (a potter, or perhaps a workshop) (Gifford 1976:32). In his review of the Barton Ramie volume, Adams (1977: 970) noted that Gifford's view that type-variety would allow us to recognize (rather than *create*) emically real ceramic units "has been rejected by most of his colleagues" and I think we should continue to reject it. However, as Adams went on to note, Gifford's type-variety units are "logically rigorous and tightly observed. . . . As such, they are excellent 'etic' units with which to attempt to establish ancient cultural categories or 'emic' units." This I think we can accept. Despite its problems, the Barton Ramie monograph is still very useful for us, otherwise we wouldn't use it. But, people who believe Gifford's comments about the emic reality of types and also neglect context are not doing ceramic analysis and should not claim to be doing so. Matching your sherds to Gifford (1976) can produce useful information (even the fact that the sherd under observation *looks* like one found at Barton Ramie is in some way useful), but it can also very easily

lead to erroneous conclusions about chronology and interaction, and it is not analysis (Ball and Taschek in press).

Gifford's legacy is a complex one for those of us working in Belize, and we set aside a whole section of the workshop for specific comments on the Barton Ramie study. Participants concluded that Gifford (1976) is useful for Barton Ramie and sites nearby but it is hard to apply elsewhere, especially in Southern Belize (Jaime Awe suggested Chol-Yucatec Maya ethnic differences may be part of the reason for this). The Barton Ramie report is also more useful in periods of relative ceramic homogeneity (especially the Preclassic period) than in periods of ceramic regionalization like the Terminal Classic. There is always grumbling about Gifford (1976) but, overall, workshop participants did not have all that much specific to say. Anabel Ford suggested that the Aguacate Group trays at Temple University may in fact contain multiple types and others noted that the slip characteristics of Aguacate Orange vary and make classification in relation to the later Peten Gloss types difficult. The Aguacate Group has been the subject of much discussion (e.g., Brady, et al. 1998) and these issues are addressed by Pring (2000:15-18)(my thanks to Laura Kosakowsky for directing me to that discussion). I noted problems with Minanha Red that were first suggested to me by Joseph Ball (personal communication, 1999): The illustrations in Gifford seem to show forms from at least some other red types.

Generally, people at the workshop felt that the types in the Barton Ramie report were unnecessarily specific (Gifford was a "splitter") and the study might be more useful if there was more lumping of types. Of course, types could be lumped now because type-variety classifications are meant to be open to revision even after they are published, but the fact is that published reports tend to fossilize. The frequently-cited reassignment of Daylight Orange: Darknight Variety from the Postclassic period to the Terminal Classic period is an

exception that was noted at the workshop. Several people noted that the types grade into each other (e.g., Augustine Red and Paxcaman Red) but that is a characteristic of types in many classifications. Classifications impose order on chaos but rarely—if ever—perfectly. It is also important to remember that the Barton Ramie monograph does not work as well the farther you get away from Barton Ramie. Of course those issues are not specific to Gifford's work or a result of it. Several people expressed the wish that he had been more specific, objective, and quantitative especially in his type descriptions to make it easier to compare new samples, because comparison—like chronology—is a major concern for those who study pottery.

In fact, a major impetus for the ceramic workshops that have been held intermittently in Belize since 1991 is to allow archaeologists to see and compare each other's sherds firsthand. Given how much money and time we spend on excavation and analysis it is odd how rarely we do this, and yet it is absolutely essential for consistency across the country. Whittaker et al. (1998:131) have pointed out that in archaeology generally, consistency in classification is not given the attention it deserves. Different people see different things in any sample of pottery and, as I noted above, different research goals will lead to the privileging of some attributes over others. Archaeologists interested in consumer choice, for example, may not consider temper to be particularly important when creating types, whereas those interested in manufacturing issues may. Another problem that was discussed in some detail at the workshop was the fact that sherds or vessels often have the characteristics of multiple types. Both Jaime Awe and Lauren Sullivan described or showed us examples of such transitional types at the workshop in reference to the Cunil Phase and early facet Jenney Creek in the Belize Valley.

It is no secret that we have a serious problem in Maya ceramics with interobserver consistency, and the workshop

demonstrated this again. In almost every case where more than one person at the workshop suggested a type assignment for the sherds I brought to the workshop, there was disagreement (of course, many of the sherds people bring were chosen because they *are* unusual). Whittaker et al. (1998) argue that interobserver consistency should be one of the criteria we use to evaluate typologies. This is an important issue since different typological assignments can lead to different interpretations. Chronological assessments are an obvious issue, but broader culture-historical interpretations are also implicated. For example, sherds that I believe are from the Zapkah Group, common at Lamanai and along the coast, are identified at El Meco (Quintana Roo) as Augustine Red and Paxcaman Red (Robles Castellanos 1986: Fig. 44, 45), which are usually found in western Belize and the Peten. These identifications are used to argue for contact between the northern coast of the Peninsula and Peten.

The criterion of abundance suggests that a type that is very common at a given site was likely to have been produced nearby. The practice of simply searching published reports for the best fit for a given sherd frequently results in identifying a single sherd based on a single illustration or description. Well-illustrated and/or widely available monographs like Gifford (1976) and Smith (1971) are frequently consulted, but this can lead to the impression that the types described in them are more widely distributed than they are. To facilitate the accessibility of images and descriptions of pottery and to serve as a place for the discussion of these issues, I created a wiki space for the ceramic workshop entitled "Maya Pottery of Belize" (<https://sites.google.com/site/belizepotterywiki/home>.) This is an easily editable wiki for which anyone can create a free account. Summaries of most of the workshop discussions are posted there, and I would like to see it become a resource on Maya pottery in Belize more generally. I've added sections for the major chronological periods (Preclassic, Classic, etc) in the hope that it

will encourage people to post images of their ceramics (see below).

On the second day of the workshop we focused on basic procedures for the macroscopic characterization of paste or fabric. Anabel Ford raised the issue of standard observations that would increase the comparability of samples, and she noted that these concerns are far from new. Her 1992 report with Nicole Woodman and Lisa Lucero on the 1991 workshop noted that "Comparability of collection descriptions and reporting... became the central theme of the 1991 workshop" (Ford, et al. 1992:26). Sadly, not much has changed in 19 years and I think it is fair to say that comparability of collection descriptions and reporting became the central theme of the 2010 workshop! Ford shared the coding sheet for the attributes that she records for her pottery on the wiki and this could be a useful document many of us to consider. Most of us who work with pottery produce some sort of coding system and the wiki is a good place for us to post and compare them. After the workshop John Blitz sent me a copy of Brown (1997) which is a sorting manual developed for type-variety pottery classification in the Lower Mississippi Valley. The manual includes flow charts which direct the reader through the process of classification in that region. I will begin experimenting with the creation of similar flowcharts in my Archaeological Methods class at SUNY Geneseo in the spring of 2011 because I think these may be one way to make consistency in classification easier.

People create and identify types in varied ways because they privilege certain attributes over others, and explicit statements about which attributes were recorded and why could make a big difference in increasing the comparability of samples. When it comes to the characterization of pottery fabric there is, perhaps, potential for more consistency and at the workshop Anabel Ford and Linda Howie made suggestions about how to approach fabric characterization. Their basic message was to be cautious when assessing the inclusions in pottery. Clays

may have rocks in them which can make them look like they are tempered (sandy clay will produce pottery that looks like it has had sand temper added). Because inclusions can occur naturally, while temper is added by people, the term "inclusion" is a more general term than "temper" to use in the description of pottery fabrics. Identification of temper has implications for production locale, so confusing calcite with quartz not only misidentifies the inclusions but an opportunity to consider production location is lost (e.g., carbonate sand indicates coastal provenance but it is very easy to mistake it as ash; biotite and muscovite mica come from different batholiths). Mica and crystalline calcite are also easily confused. Dolomite only occurs in some areas of Belize (e.g., Southern Belize) and is often macroscopically indistinguishable from calcite --you need to stain it in thin section to be sure. Rather than leaping to the conclusion that pottery is calcite tempered simply because it sparkles, it is better to describe in some detail exactly what one sees. For the description of inclusions, workshop participants suggested noting color, size, sorting, and roundedness/angularity using geological standards cards (often called sand gauges). A 10% hydrochloric acid solution dropped on a freshly broken sherd edge will provoke a fizzing reaction with carbonate inclusions but one should be careful to note whether the inclusion fizzes because the clay body may also be carbonate rich.

The wiki includes brief descriptions from the workshop of carbonates (e.g., calcite, limestone, dolomite, and sascab), quartz, quartzite, shell, grog, magnetic nodules, and organic temper. Perhaps the most important point about inclusions involved volcanic ash temper. Many of us routinely assume (and say) that finely tempered, dusty -textured sherds are volcanic ash tempered but to be sure one has to subject the sample to petrography. Materials that can mimic ash include very fine calcite but these will react to acid whereas volcanic ash will not, so acid is a

good first step in assessing whether ash temper is present.

Along with more empirical, descriptive methods in pottery discussions, increased availability of comparative collections like the ceramoteca at INAH Merida would help to reduce interobserver variability. Unfortunately, funding for comparative research and the creation of reference collections is difficult to get and undervalued even among archaeologists. A ceramoteca for Belize would be a wonderful thing, but in the meantime the internet provides us with an opportunity to disseminate limitless color images and lengthy descriptions of pottery. This wiki would allow those willing to share information and images to do so, and because one needs to login, we can still maintain some control and tracking of who use it. I can imagine creating a kind of virtual ceramoteca here, as well as using it to store other information about pottery in Belize including guidelines for classification and best practices.

Conclusion

The challenges I see with all the above ideas include giving people an incentive to utilize the information and at the same time control the access to it. One way to do this would be to only allow people who contribute to it to view it. The other issue is that people are sometimes quite protective of unpublished data, for good reasons. A set of standards about permissions would have to be established. For example, use of images could be prohibited or perhaps limited to some contexts (e.g., use for teaching but not publication). These are issues that come with internet archiving which require us to be both generous and ethical.

Another promising aspect of pottery studies in Belize is the range of method and theory applied to pottery by archaeologists working here. Despite some problems, we are pretty sophisticated in our use of type-variety in Belize, and people use a variety of other approaches with type-variety or separate from it (e.g., modal analysis, epigraphic analysis, and contextual

analysis). The ever-growing battery of materials science techniques available to archaeologists, and their declining cost (e.g., portable X-ray Florescence) have tremendous potential. We are certainly finding at Lamanai that multiple independent analyses using different methods can be very powerful. Another factor worth noting is that those of us working closely with ceramics in Belize tend to get along pretty well.

Pottery is the most ubiquitous and arguably the most informative artifact class we have in Maya archaeology. Given its informational potential, Maya pottery studies are still in their infancy. Because so many archaeologists are working in Belize, much of the growth in our use of Maya pottery will occur in Belize. I'm excited to be a part of such a dynamic area of study and I hope we are able to continue to meet intermittently to discuss these issues in person.

Acknowledgements This year's ceramic workshop was held, as it was in 2007, at Dr. Awe's house and once again his wife Myka had to deal with an over-caffeinated group of archaeologists with sherds in tow. I want to express my thanks to both Jaime and Myka for hosting the workshop in their home. It is not the only place we could do it, but it is hard to imagine a nicer place to meet, and that lovely setting on the porch overlooking the valley made it, again, a very nice event. It is a testimony to Dr. Awe's commitment to archaeology that he is willing to open his home to us in that way. Thanks also to everyone who attended.

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